

1983

Washington University Magazine, Summer 1983

Follow this and additional works at: http://digitalcommons.wustl.edu/ad_wumag

Recommended Citation

"Washington University Magazine, Summer 1983" 53, 3. (1983). Bernard Becker Medical Library Archives. Washington University School of Medicine, Saint Louis, Missouri.
http://digitalcommons.wustl.edu/ad_wumag/89

This Article is brought to you for free and open access by the Washington University Publications at Digital Commons@Becker. It has been accepted for inclusion in Washington University Magazine by an authorized administrator of Digital Commons@Becker. For more information, please contact engeszer@wustl.edu.

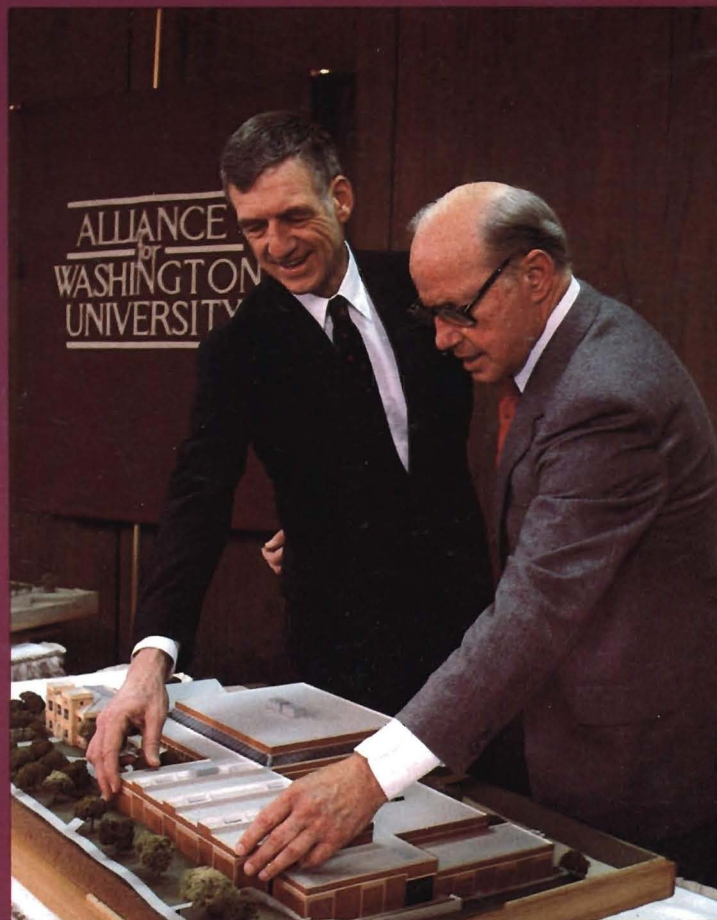


WASHINGTON
UNIVERSITY
IN ST. LOUIS

Washington University

Summer 1983

Magazine



ALLIANCE
for
WASHINGTON
UNIVERSITY

Triumphant at Last

Did Barbara Barrett cold-bloodedly execute her husband, as prosecuting attorney Cathy Gilbert argued, or was Barrett's act self-defense against abuse, as the defense counsel from Boston College School of Law claimed? Washington University's mock-trial team of Gilbert and David Mason successfully argued both sides of the hypothetical Barrett trial during six rounds of a three-day National Mock Trial Competition in Houston in March. Each time Gilbert and Mason convinced the trial judges, all experienced litigators, of the justice of their position.

By their carefully built and persuasively argued cases, the Washington University School of Law team captured the national competition and, in addition, Gilbert won the Best Advocate Award.

It is one of the rare times in the seven-year history of the competition that the traveling trophy has left the East Coast or Texas regions. Won in its inaugural year by Harvard University School of Law, the trophy has been passed back and forth among Eastern and Texas law schools. This year it went home with the North Midwest Region champions.

With satisfying consistency in the past three years, Washington University teams have represented their regions in three separate competitions testing skills in advocacy and litigation. They have sometimes gone to the New York finals of the granddaddy of all advocacy contests, the National Moot Court Competition; they have been at the national finals for an international law com-

petition; and they have previously also won the right to represent their region at the mock trial competition.

In these events, individual students have captured national honors, but Gilbert, Mason, and coach Ronald Carlson, professor of law, are the first University law team in recent times to become national champions and carry home the team honors.

"Interestingly," notes Carlson, "at each of these national trials we have seen different groups of schools, but Washington University has been the only school to be consistently represented at all three. I feel very comfortable telling students that in advocacy and litigation there is no better program in the country than the program we have built in the past decade."

The National Mock Trial Competition is sponsored by the Young Lawyers and Litigation divisions of the American Bar Association, the American College of Trial Lawyers (ACTL), and the Texas Young Lawyers Association. The finals at Houston's Federal Courthouse were judged by members of the ACTL. Judge James Skelly Wright of the U.S. Court of Appeals, Washington, D.C., presided at the championship trial.

Gilbert's reaction to the championship was, "I'm amazed."

Mason said, "I was gratified to accomplish something that I felt Cathy and I could do all along. I knew what she could do, and she did it. I wasn't too surprised."

Gilbert, who plans to be a criminal lawyer, is from Mt.

Vernon, Missouri. Mason, who joined the office of Missouri Attorney General John Ashcroft after graduation in May, is from Nashville. He was recently named "Graduate of the Year" for the Midwest province of Phi Delta Phi, a national law fraternity.

Triumphant at last, the law school gave a party.



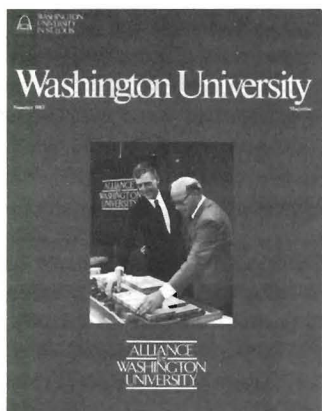
Professor Ron Carlson holds the team trophy and Cathy Gilbert holds her individual trophy as Cathy's partner David Mason (center) and Law Dean F. Hodge O'Neal look on. Mason and Gilbert won the National Mock Trial Competition and Gilbert won the Best Advocate Award.

Washington University

Magazine

Summer 1983

Vol. 53, No. 3



On the cover: Chancellor William H. Danforth and Board Chairman George Capps with architects' model of the new athletic complex. See story page 2.

On the back cover: Allies in the laboratory. David Kipnis (left), Adolphus Busch Professor of Medicine, and Howard Schneiderman, vice president, Research and Development at Monsanto Company. See story page 18.

Photography:
Herb Weitman
Peter Zimmerman
and David Gulick

Washington University, Summer 1983,
Vol. 53, No. 3

Washington University (ISSN 0162-7570)
is published quarterly by Washington
University, St. Louis, MO 63130.

Second-class postage paid at St. Louis,
Missouri.

Address changes: Send address changes
and corrections to: Development
Services, Campus Box 1082, Washington
University, St. Louis, MO 63130.

Correspondence: Send letters to:
Magazine Editor, Office of Publications,
Campus Box 1070, Washington University,
St. Louis, MO 63130.

For copies of articles or for permission
to reprint, please contact the Office
of Publications.

© 1983 Washington University



The Alliance for Washington University

2

*Case statement for the needs of
the 1980s*



Compendium

10

*Spring visitors, events, updates—
news and notes*



Urban Revitalization

14

*A land-use law expert looks at new
partnerships*



Allies in the Laboratory

18

*The University and industry pioneer
joint research contracts*



Remembering Tennessee

24

A Memoir from the Eliot days



Luis Glaser: Window on Biochemistry

26

And one cell said to another...

ALLIANCE *for* WASHINGTON UNIVERSITY

*An announcement about the
future of Washington University*



Chancellor William H. Danforth, ALLIANCE Chairman George H. Capps, and Senior Vice Chancellor for University Relations Herbert F. Hitzeman, Jr., reflect the mood of the occasion as they examine a model of the new Clinical Sciences Research Building before the campaign announcement on May 2. Construction progress is shown in the photograph on page 3.

On May 2, 1983, the Board of Trustees of Washington University announced the largest fund-raising program in the University's history. Called the ALLIANCE FOR WASHINGTON UNIVERSITY, the program seeks \$300 million in private gift support to increase the University's endowment, broaden opportunities for its faculty and students, expand and improve its physical facilities, and ensure its financial stability through the 1980s.

"This program is vital to the future of Washington University," said George H. Capps, president of Capitol Coal and Coke Company and general chairman of the ALLIANCE FOR WASHINGTON UNIVERSITY. "It is perhaps equally vital to the future of St. Louis, the Midwest, and ultimately the future of our society."

Capps said the decision to embark on this major campaign, one of the five largest in the history of American higher education, was the result of a planning process begun in 1977, when the board authorized the establishment of the Commission on the Future of Washington University. The commission was composed of 270 national and community leaders organized into ten task forces that studied the major divisions of the University and prepared reports containing 194 recommendations on the University's future.

W. L. Hadley Griffin, chairman of the Brown Group, Inc., and chairman of the University's Board of Trustees, was chairman of the commission. He also headed a special committee of trustees that reviewed the task force reports and recommended general goals for the University for the 1980s. The trustees' committee also identified the minimal needs for gift support for that period.

The \$300 million fund-raising goal is "an absolute minimum if Washington University is to educate the leaders of tomorrow and to serve as a center of research and scholarship," according to Capps.

Capps announced that the fund-raising program, which has been carried on concurrently with the planning process, has received \$142 million in advance gifts and firm



Richard F. Ford (left) is chairman of the Capital Resources Executive Committee, one of two major committees of the ALLIANCE; the other, the Annual Programs Executive Committee, is headed by Zane E. Barnes.

commitments from alumni and friends since 1980.

Adding impetus to the program is a \$45 million challenge grant from the Danforth Foundation, which was announced in January 1982. Under the terms of the grant, the University must raise three dollars in gifts or firm commitments from other private sources for each foundation dollar. Funds from the Danforth Foundation challenge, which extends through 1987, will be added to the University's endowment.

The financial objectives are \$100 million for operating funds and \$200 million for capital funds. The operating funds include both unrestricted support from alumni and friends and special-program support for scholarships and faculty

research. The capital funds include \$140 million for endowment and \$60 million for bricks and mortar.

Washington University has been carefully managed, according to Capps. "The University enters the campaign in sound financial shape. It has operated in the black and avoided both the spending of endowment and deferral of maintenance. We are building on strength."

The ALLIANCE FOR WASHINGTON UNIVERSITY is the largest university campaign between the coasts. Only Columbia, Harvard, University of Southern California, and Yale have mounted campaigns of similar magnitude.

"The University must preserve the best of its past and present while ensuring its continued distinguished service to St. Louis, the Midwest, and the nation," Herbert F. Hitzeman, Jr., senior vice chancellor for University relations, said. "That is the purpose of the ALLIANCE."

Washington University has grown greatly in strength and prestige since it was founded 130 years ago by an alliance of educators and community leaders to educate the young of St. Louis. Its progress from a city college to leading national university has been assured by an ever-broadening base of support, firmly rooted in St. Louis but reaching the nation's borders and beyond," Hitzeman added.

(continued next page)

ALLIANCE *for* WASHINGTON UNIVERSITY

Scenes from the Alliance Announcement



Guests enjoy cocktails and conversation before the ALLIANCE announcement dinner.



Samuel A. Wells, M.D., Bixby Professor of Surgery and department head (left), and Eugene M. Bricker, M.D., professor emeritus of clinical surgery and former trustee, enjoy a moment with Richard Sakimoto, M.D., School of Medicine alumnus.



Chancellor Danforth outlines the University's achievements and aspirations to the guests at the announcement celebration.



William Stuckenberg and his sister Elvera take a turn on the dance floor following the celebration program.



Sam Fox, school chairman for Business, and Mrs. Fox chat with Chancellor Danforth.



Social Work Dean Shanti Khinduka talks with Richard J. Modde (right), school chairman for Social Work.



George Capps answers a reporter's questions about the \$300 million program.

ALLIANCE *for* WASHINGTON UNIVERSITY

"No Lesser Goals are Worthy of our Heritage"

Statement from William H. Danforth, Chancellor

The ALLIANCE FOR WASHINGTON UNIVERSITY is one of the most important undertakings in the history of our institution. The decision to embark on a \$300 million campaign was not made easily or lightly. The planning was extensive. Five years of review and analysis went into the preparation. Each part of the institution developed its plans and priorities, which were then submitted to a critical outside review by a task force of the Commission on the Future of Washington University. Finally when each task force had completed its work, a committee of the Board of Trustees reviewed the reports, set some general goals, and ascertained the need for a major campaign, which was subsequently announced on May 2, 1983.

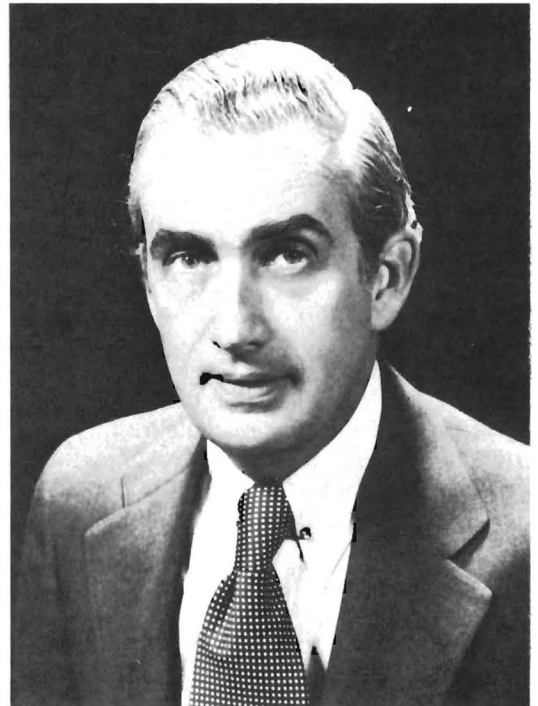
I should like to take this opportunity to share with the alumni and friends my thoughts about Washington

University and the goals before us. It is important to do so because Washington University is not the product of the work and support of the few but of the many. One hundred and thirty years ago things were different. A handful of citizens could establish Washington University with a small faculty. Today their creation has grown beyond their dreams. More than 1,200 faculty oversee the academic work of the institution. More than 4,000 active volunteers and 21,000 donors scattered around the globe play the role of the few leaders in 1853. To build on the accomplishments of the past and to meet the challenges of this day Washington University requires broad understanding and support of its many sons, daughters, and friends.

We start with a great heritage and a strong base. Washington University has achieved distinction as a major national research university. It has continued steadily to improve. The faculty is recognized nationally and internationally. For example, Paul Lacy has just been elected to the National Academy of Sciences, bringing Washington University's total to fourteen. Professors William Gass and Mona Van Duyn have just been elected to the National Academy and Institute of Arts and Letters, bringing to four Washington University's faculty



Stanley L. Lopata, chairman of the Alumni, Friends, and Parents Committee, is shown with Robert C. Drews, M.D., school chairman for Medicine.



David C. Farrell chairs the Business, Industry, and Foundations Committee.

ALLIANCE for WASHINGTON UNIVERSITY



*Charles F. Knight, member,
Capital Resources Executive
Committee*



*W. L. Hadley Griffin, Chairman,
Board of Trustees and Member,
Capital Resources Executive
Committee.*

in this 250-member body. Stanley Elkin has recently been awarded the National Book Critics Circle Award. In the last year 48 individual faculty members received special awards and honors.

We have wonderful students. In recent years the SAT average of Washington University students has been rising while the national average has been declining. A decade ago Washington University had only a handful of National Merit Scholars in each freshman class. In recent years that number has averaged about 150. The School of Medicine has continued to have 50 or more applicants for every opening. The M.D.-Ph.D. program that prepares medical scientists of the future has enrolled some of the most able young people in the country.

Like the faculty, our students have been winning their share of awards. Our mathematics team has come in first or second in the William Lowell Putnam national competition four times in the last six years. This year a team from the School of Law won the national mock trial competition. A team member was chosen as the outstanding student litigator in the country. Students from the School of Business won the McIntyre Commerce Invitational competition. Perhaps more important, to know our students is to have confidence in the future leaders of our nation.

We have marvelous facilities. The Hilltop Campus is always beautiful, a great heritage from our past. The Medical Campus, including the associated hospitals, has modern physical facilities second to none in the world. Even more improvements are on the way. The Clinical Sciences Research Building, which will link the Medical Campus together, is partially completed. Ground has been broken for modernization of the athletic facilities. A beautiful new building for the School of Business is on the

drawing boards. Other improvements and renovations are planned so that our facilities will continue to serve Washington University well.

Just as important are our alumni and friends. No institution could have a better group. The growth in interest and understanding has been gratifying. Alumni support has increased over two-and-a-half-fold in the last decade.

Serving the Region and the Nation

Washington University has a heritage of service. Bright and able young people have come first from the city of St. Louis and more recently from the world over. They have been provided with education and with professional training. They have graduated and gone on to become community leaders in all walks of life.

Washington University also serves in a variety of other ways. It enriches the scientific strength of the nation. The recent agreements with Monsanto and Mallinckrodt have become national beacons of how a university and industry should cooperate. The University adds to the cultural life of its community and the nation. Washington University serves people directly; for example, the School of Medicine, including the associated hospitals, provides care second to none in the country, at least \$50 million of which was unreimbursed last year.



*Elliot H. Stein, member,
Capital Resources Executive
Committee*



*Lee M. Liberman, member,
Capital Resources Executive
Committee*

Goals for the Future

We start not only from a strong base, but with well-defined goals which have been adopted by the Board of Trustees.

Goal A. Continue Washington University's growth as a university of international stature. The University should seek to recruit and retain faculty and students of the highest ability and accomplishment. Research and scholarship should be of significance and should compete successfully for available resources.

ALLIANCE for WASHINGTON UNIVERSITY



*August A. Busch, III, member,
Capital Resources Executive
Committee*



*I. E. Millstone, member,
Capital Resources Executive
Committee*

Goal B. Offer first-rate educational experiences to all students in and out of the classroom. First-rate education requires breadth and balance so that the whole may be greater than the sum of the parts. Undergraduate education, which is central to any university, needs special attention.

Goal C. Concentrate on areas of strength. The 1980s should be a period of doing better what is now done well. Each academic unit should emphasize its special contributions to scholarship and education and build on those strengths. New ways to link resources and mutually supportive endeavors should be sought. Washington University has broad and deep university-wide strength in biomedical education and research. In this area the University should continue to strive to be the best in the world.

Goal D. Be an integral part of the community and the region. Washington University is privileged to be in St. Louis, and we are unusual among the great universities in the close association we have with our community. The University's development, without being parochial, should make sense in its geographical setting. Services given as part of the mission should be of high quality.

A Sense of Commitment

Finally, we start with a strong internal commitment. The faculty and staff are doing their part. Each school's dean and the faculty have taken on responsibilities for planning and for using their resources to achieve the best possible academic results. Each school has made significant progress in recent years. Here are a few examples of why I am personally very proud to be part of this effort.

The faculty of the School of Medicine has earned, largely from clinical practice, over half the cost of the Clinical Sciences Research Building, an unprecedented accomplishment that has permitted starting the building much earlier than would otherwise have been possible. The George

Warren Brown School of Social Work, during a period of financial stringency, has carefully added to its endowment. The School of Engineering has developed innovative ways of making its equipment available to industry while not in use for academic purposes. A comprehensive review of undergraduate teaching has been under way for months.

A Shared Responsibility

In sum, I believe we are well positioned for an undertaking that keeps our institution headed in the right direction. The campaign itself is now under way. It is for Washington University, for the entire institution. The whole is greater than the sum of its parts, but the whole depends upon the success of each part. Each part of the University has developed its own priorities that fit into Washington University's priorities. Each part has its own special challenges and needs and each part its own alumni and friends.

The ALLIANCE FOR WASHINGTON UNIVERSITY needs all of the University's alumni and friends, whatever their special interests and loyalties. Every gift will count toward the overall goal.



*Edward J. Schnuck, member, Capital Resources Executive
Committee*

A Challenge to Benefit Humanity

I should like to conclude with a look at the future. Progress occurs when each generation builds upon the accomplishments of the past. The dreams of our founder, William Greenleaf Eliot, and of Robert Brookings and of Arthur Holly Compton, the hard work and examples of former chancellors like Throop and Shepley and Eliot—the generosity of many families such as the Busches, the Lehmanns, the Mallinckrodt, the McDonnells, the Olins and thousands of others, the leadership from alumni and countless friends and especially the dedication of the faculty—all have helped mold the Washington University

ALLIANCE for WASHINGTON UNIVERSITY

of today. The challenge is to preserve past accomplishments and to consolidate present strengths. The goal is to build a grander edifice which will be a beacon of civilized learning for generations to come. The acceptance of such a challenge is the mark of a great institution. The desire to see the next generation progress beyond the limitations of the present is a very generous impulse.

I see Washington University as a great contribution to the world beyond the campus and to a day that is yet to come. I see graduates leaving to make special contributions to their home communities. Books and papers the faculty write will travel the globe. They will be read and pondered not only by scholars of today but by those of future generations. Discoveries made in the laboratories and clinics will benefit our children and our grandchildren and those of the English and the Chinese and the Russians and the Afghans and the Argentines—in fact, all of mankind.

These contributions will be not to Washington University but by Washington University and its community of alumni and friends. No lesser goals are worthy of our heritage. The task is not easy, but Washington University has met similar challenges in the past. We can do no less in our era.



Donald E. Lasater and Edwin S. Jones, members, Capital Resources Executive Committee

Financial Objectives of the ALLIANCE FOR WASHINGTON UNIVERSITY

Endowment for Academic Programs		\$ 92 million
Professorships	\$50 million	
Research and Teaching Funds	20 million	
Departments and Schools	14 million	
Libraries	8 million	
Academic Facilities		\$ 49 million
Clinical Sciences Research Building	\$21 million	
School of Business	13 million	
Classroom, Office and Laboratory Renovations	7 million	
Libraries	5 million	
School of Engineering	3 million	
Endowment for Student Aid		\$ 40 million
Scholarships and Fellowships	\$35 million	
Loan Funds	5 million	
Student Resources		\$ 19 million
Athletic Facilities	\$ 9 million	
Endowment for Student Activities	6 million	
Renovation of Student Areas	4 million	
Gifts for Current Use		\$100 million
Annual Fund	\$34 million	
Special Program Support	66 million	
Total		\$300 million

ALLIANCE *for* WASHINGTON UNIVERSITY

Volunteer Leadership

General Chairman

George H. Capps, *President*, Capitol Coal and Coke Company

Capital Resources Executive Committee

Chairman:

Richard F. Ford, *President*, Centerre Bank

August A. Busch III, *Chairman of the Board and President*, Anheuser-Busch Companies, Inc.

W. L. Hadley Griffin, *Chairman of the Board*, Brown Group, Inc.

Edwin S. Jones

Charles F. Knight, *Chairman and Chief Executive Officer*, Emerson Electric Company

Donald E. Lasater, *Chairman of the Board*, Mercantile Trust Company

Lee M. Liberman, *Chairman and President*, Laclede Gas Company

I. E. Millstone, *President*, Millstone Construction, Inc.

Edward J. Schnuck, *Chairman of the Board*, Schnuck Markets, Inc.

Elliot H. Stein, *President*, Scherck, Stein & Franc, Inc.

Annual Programs Executive Committee

Chairman:

Zane E. Barnes, *President*, Southwestern Bell Telephone Company

Chairman, Alumni, Friends, and Parents Committee:

Stanley L. Lopata, *Chairman of the Board and Chief Executive Officer*, Carboline Company

Chairman, Business, Industry, and Foundations Committee:

David C. Farrell, *President and Chief Executive Officer*, The May Department Stores Company

Schools Chairmen:

Architecture: King Graf, *Executive Vice President*, Hellmuth, Obata & Kassabaum, Inc.

Arts and Sciences: Henrietta W. Freedman, *Vice President*, Semcor

Business: Sam Fox, *Chairman*, Harbour Group Ltd.

Dental Medicine: Dr. John E. Gilster

Engineering: Jerome F. Brasch, *President*, Brasch Manufacturing Company

Fine Arts: Frances T. Martin

Law: Frederick L. Kuhlmann, *Vice Chairman of the Board and Executive Vice President*, Anheuser-Busch Companies, Inc.

Medicine: Dr. Robert C. Drews

Social Work: Richard J. Modde



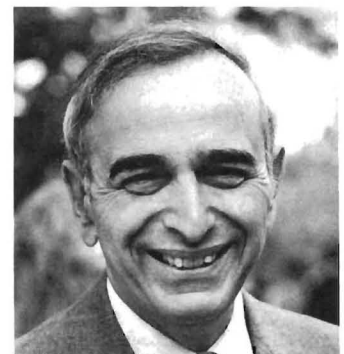
King Graf, school chairman for Architecture



Henrietta W. Freedman, school chairman for Arts and Sciences



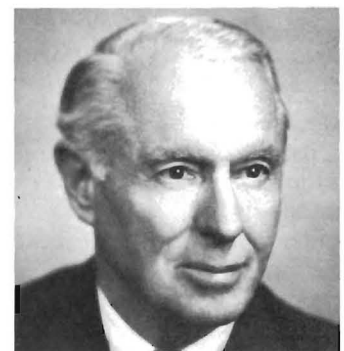
John E. Gilster, D.D.S., school chairman for Dental Medicine



Jerome F. Brasch, school chairman for Engineering



Frances T. Martin, school chairman for Fine Arts



Frederick L. Kuhlmann, school chairman for Law

Office Calls

Practicing dentistry on children must be an art of its own, but what about dental care for children who cannot hear, are autistic, retarded, or suffering from cerebral palsy? To see that St. Louis's handicapped children (and adults) receive care and to give dental medicine students an opportunity to learn to cope with such patients, the School of Dental Medicine and the Missouri Elks Benevolent Trust have been prime movers in establishing a permanent St. Louis clinic for handicapped patients.

Shirley Pierce, WU assistant professor of community and preventive dentistry, explains that handicapped persons are frequently hospitalized for even minor dental work, even though she believes that up to 95 percent of these special cases can be handled under normal office procedure. "If I can work with dental students at a formative age, before they decide they can't treat these people, they won't develop a mental block against the idea," she says.

The Washington University School of Dental Medicine has participated in providing such care and training through a statewide mobile dental program under Pierce's direction, but the mobile unit concept often faced severe limitations, she said. Establishing a clinic at a permanent location has allowed the staff to expand its efforts.

The Elks Dental Clinic, at 634 North Grand Boulevard in mid-town St. Louis, is staffed by University dental students and faculty and

dental hygiene students from Forest Park Community College. Patricia Hanlon, clinical assistant in community and preventive dentistry, is supervising dentist at the clinic. Some of the advice Pierce and Hanlon give to students working at the clinic is to speak softly and reassuringly and to keep steady, physical contact with the patient. They also urge extreme caution in using premedication, since it sometimes has the opposite effect intended, particularly among autistic patients. As an added touch for youngsters, a toy monkey dangles from a light at their feet and a stuffed dog named Henry is available for clutching.

In addition to the major support provided by the University and the Missouri Elks, funding comes from seven public and private sources. Children are treated free and adults pay a small sliding fee based on their income. The clinic operates daily on weekdays.



Distinguished Scholars

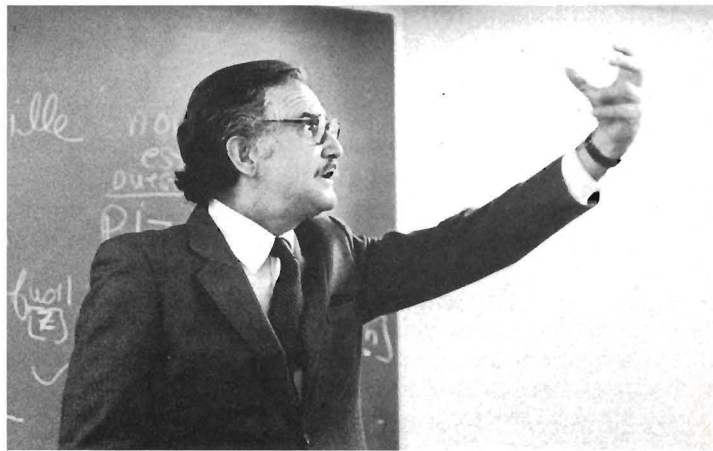
Carlos Fuentes, the noted Mexican novelist, essayist, critic, and diplomat, spent April at the University as Lewin Visiting Professor in the Humanities. His full schedule for the month's residence included major addresses on four successive Wednesdays at Graham Chapel, participation in a two-day symposium on Latin America, and meetings with numerous graduate and undergraduate classes. Colombian novelist Gustavo Alvarez Gardezabal was also on campus for the symposium, sponsored by the departments of history and romance languages and the Missouri Committee for the Humanities.

The son of a career diplomat, Fuentes, who served as Mexican ambassador to France in the mid-1970s, grew up in several Western and South American capitals. Educated in law, he himself held Mexican diplomatic posts during the 1950s, as well as two decades later. His first novel, published in 1960 in English under the title *Where the Air is Clear*, has been followed by three

other novels, the latest *Terra Nostra*. A journalist and editor as well, Fuentes also has written a half-dozen movie scripts.

At Washington University, Fuentes is the fourth scholar to hold the visiting professorship established through the generous gifts of Tobias Lewin, a 1932 graduate of the School of Law, and his wife, the late Hortense Lewin. The Lewins established the visiting professorship in 1977 to express "a deep commitment to broad humanistic studies" and to promote an understanding of history and the humanities both within the University and the community at large.

The first Lewin professor was Sir John Plumb, professor of modern English history at Christ's College, Cambridge. He was followed by Lawrence Stone, Dodge Professor of History at Princeton University and a scholar of the English Renaissance, and Quentin Skinner, professor of political science at the University of Cambridge and a noted specialist on political theory.



Spring Thing

Spring Thing—proof that a good product only needs advertising. Some 300 admitted students visited campus on April 10-11, a Sunday and Monday. They were entertained, oriented, and informed on Sunday and attended classes on Monday. In September, more than 50 percent of those attending are expected to become WU freshmen.

Students were housed with current undergraduates. The Chase Hotel served as host for more than 150 parents who also came. Spring Thing is the final admissions office event for admitted students; during two preview weekends in November and February, the University plays host to interested students as well.

The return in applications from Preview Weekend students also is very high.

Available statistics indicate the University's freshmen will be bountiful and of high academic, as well as extracurricular, quality. Of a total 1,241 students expected, 49 will enter architecture, 105 business, 226 engineering, 69 fine arts, and a whopping 792 arts and sciences. They represent all 50 states with 282 from Missouri, 153 from Illinois, 123 from New York, 61 from Ohio, 50 from New Jersey, and 46 from Maryland. There will be one student each from New Hampshire, West Virginia, Mississippi, North Dakota, and Utah.

Standardized tests and high school performance statistics yield this profile: Verbal SAT (Scholastic Aptitude Test) average 556, math 622, ACT (American College Test) 27; 79 percent ranked in the upper one-fifth of their high school class, 60 percent in the upper tenth; 122 are National Merit Scholars.

In extracurricular performance and leadership, a sampling of the incoming arts and sciences freshmen

is revealing. Nine were senior class officers and 24 student council officers. Included in the 115 national honor society members are 25 officers. Twenty-seven were year book editors, 20 newspaper editors, 17 choir members, and 48 instrumentalists. And their extracurricular talents are as varied as their names.

All told, a super crop.



The Art of the Matter

You have to remember," said alumnus Tony Barr, director of current dramatic programming for CBS Television, "that television is an art form, just as film is, painting is, sculpture is. Within that form you can work with integrity or without it. I feel good about what I do. Remember that since television began, on major networks, there has never been one hour of blank time. It's a staggering amount of time to be filled, and not all of it has been 'quality,' but much of it has been and is. Television must entertain or move or inform, and the best of it does all three. And that is quite an accomplishment."

Barr, who graduated from Washington University in 1942 as Maury Yaffe, took time from a busy schedule this spring to spend three days with Washington University students. He met Performing Arts Area and other students on Friday, April 1, for an informal exchange, and on Saturday and Sunday, April 2 and 3, he conducted an intensive acting workshop titled "Acting for the Camera" with 11 students. The visit is an extension of his 23 year labor of love: the well-known Film Actors' Workshop, an acting school he has run for that many years in Hollywood.

An actor in Hollywood and on Broadway before he joined the television industry, Barr joined CBS-TV in 1952, first as a stage manager and then as an associate director, associate producer, and producer. Among other credits, he was, during part of this time, associate



producer of the famous *Playhouse 90*. He then went to ABC and MGM, becoming ABC-TV's vice president of current prime-time series with creative responsibility for series such as *Marcus Welby, M.D.*, *The Rookies*, *Baretta*, *The Six Million Dollar Man*, and so forth.

Now back at CBS-TV, Barr currently supervises creative elements of all on-air, dramatic prime-time series. His work begins with story concepts and includes casting of continuing roles and guest stars; approval of composer, director, and writers; and other responsibilities through the final on-the-screen version.

"We're involved in the creative process daily," he said. "Unfortunately, the decision of what goes on the air is not always based on quality. It has to do with many factors, not the least of which is the need to be competitive in a certain time slot. But I am convinced that we recognize and respect quality and within our power do everything that we can to serve that standard."

He talked to students enthusiastically and candidly

about his work and his industry. They spoke and he spoke about *MASH* and *Archie Bunker* and *The Mary Tyler Moore Show* and *Lou Grant*. They assailed him for television's shortcomings; he acknowledged those and pointed out the constraints, and he reminded them of some of the triumphs. He gave them an insider's view, and they were entertained, informed, and, perhaps, even moved.

"I found the weekend workshop to be worth much

more than the fee we paid," said Allen Gardner, a senior from Indianapolis. "We worked intensively for eight hours a day for two days learning techniques of acting before the camera that are much more technically demanding than those we are used to for the stage. Barr knows exactly what he is talking about, and his approach is very straightforward and honest. No theories, just plain hard work."

NMR Images

Last September, the University's Board of Trustees allocated more than \$2 million for a nuclear magnetic resonance facility at the medical center's Mallinckrodt Institute of Radiology. Nuclear magnetic resonance (NMR) is a new radiologic tool that takes advantage of interactions between strong magnetic fields and pulsed radiowaves to produce cross-sectional "snapshots" of the inside of the body. The technique, considered risk-free, provides images which yield not only anatomic detail, but also present profiles of the biochemical and physiological characteristics of the tissue.

Speaking recently about the NMR project, Ronald G. Evens, M.D., director of Mallinckrodt, noted, "This project has moved with amazing speed. The trustees' allocation was made less than a year ago, yet we took delivery of our system's magnet early in May."

The new unit, manufactured by the Siemens Corporation of West Germany, will be housed in

a 5,000-square-foot addition between the Rand-Johnson Pavilion of Barnes Hospital and Barnard Hospital and will be adjacent to the existing fifth floor of Mallinckrodt. The NMR device, its associated computer, and construction of the special addition are expected to cost \$3.5 million.

"We are rapidly nearing our goal of establishing an NMR center here," said Evens. "We must thank William Tao of the Board of Trustees for recognizing the importance of NMR and placing acquisition and construction on a fast track. Barnes Hospital's administration and board also rapidly approved the project and agreed to major structural changes. Smith and Entzeroth, Inc., the project architects, produced an efficient design, and our contractor, the Volk Construction Company, has kept us on schedule so far."

The unit being installed is the first phase of a two-phase NMR project. "In this first unit," explained Evens, "we will employ a whole-body magnet with a strength of five kilogauss (magnetic

force). Five kg is strong enough to magnetize the coins in the pocket of a person standing five feet from the magnet. In the second phase, a 15-kilogauss-magnet system will be located at the edge of the medical center to the east of the School of Dental Medicine. This larger magnet will be in place and operating by January."

Installation of the NMR devices will place Washington University in an elite group. Few medical centers have made such a large commitment to the new field: few have the resources and radiologic expertise needed to assess accurately the strengths and weaknesses of NMR as a clinical device and a research tool. According to Evens, the Mallinckrodt Institute is among a handful of American institutions that can experimentally compare NMR to the full range of currently existing radiologic techniques, including state-of-the-art computer tomography (CT) and the up-and-coming positron emission tomography (PET).

"To my knowledge," he said, "fewer than ten medical centers are currently operating units in the five- to ten-kilogauss range. The only places with 15-kilogauss systems are General Electric's Schenectady plant and the Siemens plant in West Germany. We'll purchase our larger magnet from Siemens also."

Stronger magnets have two advantages to counter the disadvantage of their higher cost. NMR systems operating in places such as the Cleveland Clinic, University of California at Los Angeles, and Harvard's Massachusetts General

Hospital show that scanning time decreases as magnet size increases. "The scan speed thought to be associated with larger magnets is a significant advantage. NMR scanning is very slow compared to the quicker CT scanners," says Evens. "CT can scan a single slice through the body in two seconds. With current NMR, the same scan may take three minutes. That means a patient may have to keep perfectly still within the magnet for half an hour or longer for a complete NMR series. It's asking quite a lot."

The second advantage of the larger magnets involves NMR's ability to profile physiological characteristics.

"NMR is new," says Evens. "As scientists we must temper our enthusiasm and optimism with caution. Yet, it just seems likely that it will be a big success and open a new important level of diagnosis. What we really look forward to is the opportunity to gain access to cellular chemistry."

Greek Revival

Unlike the 1960s and 1970s, Greek life now flourishes at Washington University.

"I think that adds to a very healthy environment," says Nancy Donovan, student activities adviser for Interfraternity Council and Women's Panhellenic Association. "It gives students choices. I understand that this was once a Greek-dominated campus, and I would not like to see a return to that, but this year about 22 to 25 percent of our male undergraduates and about 15 percent of our female undergraduates have



Greek affiliations. That seems very good."

There are now 13 fraternities and six sororities on campus. The newest fraternity, Sigma Phi Epsilon, was organized last spring and was installed in mid-April with 50 members. The newest sorority, Alpha Phi, came to campus in January. It has about 55 members. All fraternities are chapters of national organizations, as are five of the six sororities; one is a local sorority. Memberships of about 50 are average for the University chapters.

These include: sororities — Alpha Epsilon Phi, Alpha Phi, Gamma Phi Beta, Kappa Kappa Gamma, Pi Beta Phi, and Phi Xi, and fraternities — Alpha Epsilon Phi, Beta Theta Phi, Kappa Sigma, Phi Beta Sigma, Phi Delta Theta, Sigma Alpha Mu, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Tau Kappa Epsilon, Theta Xi, and Zeta Beta Tau.

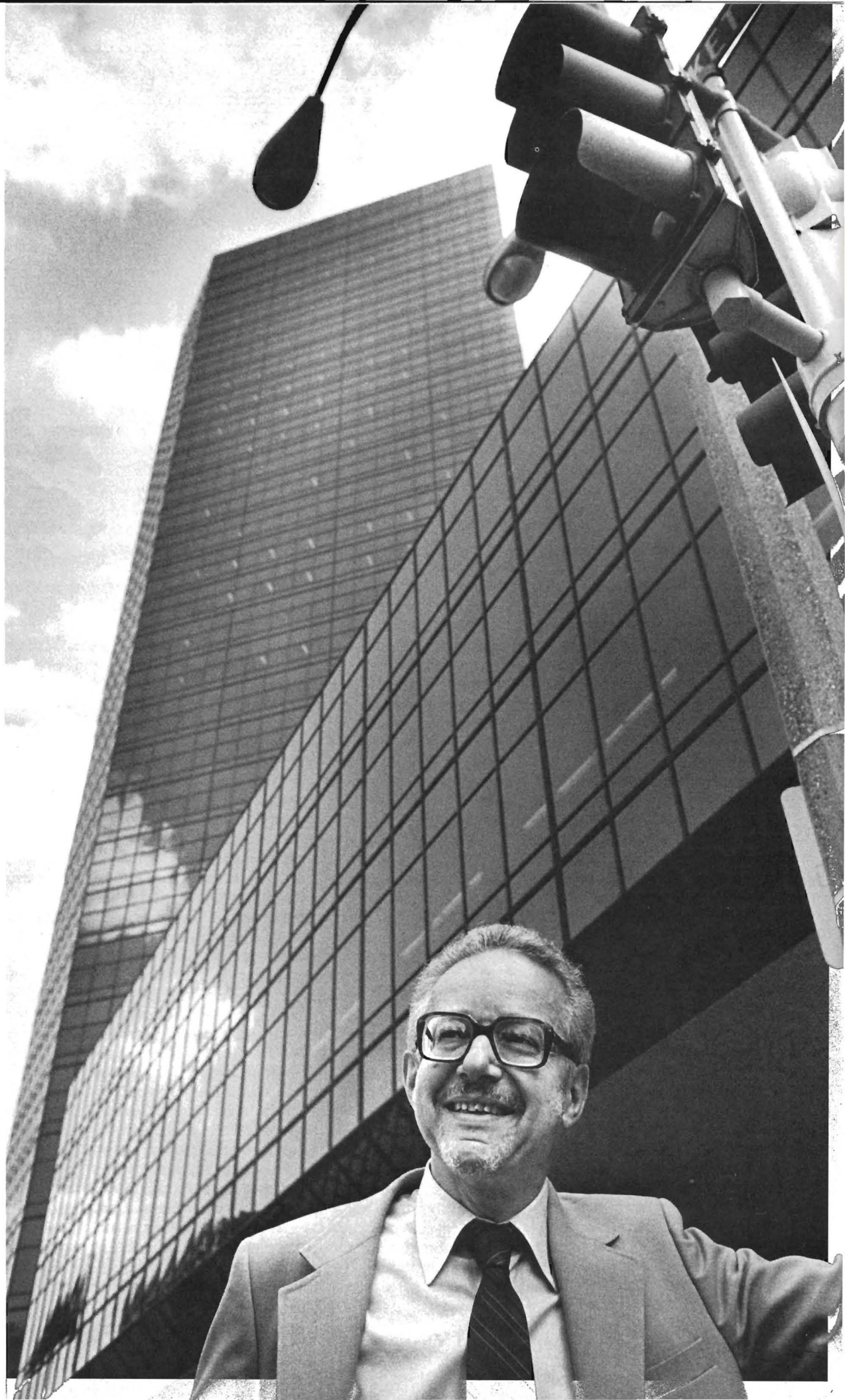
Although ten years ago there were ten national fraternities and eight national sororities on campus, membership in some

was very low and total Greek membership was less than 12 percent of the student body. That period took a heavy toll of sororities, but most fraternities seemed to survive and rebound.

The resurgence of interest in the Greek system has stirred building activity on fraternity row. Through the University, all of the houses are being renovated, some are being expanded as well, and two new houses are being constructed. Each of the projects involves much alumni support. New long-term leases are being negotiated in most cases. The entire project is to be completed by fall 1984. At that time Sigma Phi Epsilon and Alpha Epsilon Phi will move into the new houses.

Sororities have suites in the Anne Whitney Olin Women's Building.

It's interesting to note that some fraternities on campus are working hard to change their styles, as well as image: for instance, this winter at one fraternity party, liquor and beer were banned, and reports were that it succeeded very well dry.



Urban Revitalization in the 1980s

By Daniel R. Mandelker

Howard A. Stamper Professor of Law

America's urban centers are far from finished. Even downtown areas, once written off as through, are reviving in many cities. The new urban development is carried out under methods different from those of 25 years ago. The massive, government-funded slum clearance projects of yesterday have been replaced by a new form of public-private partnership. In these partnerships, cities use incentives to attract new private development and to encourage concessions from developers. They also use as an incentive a newer form of mixed-use development in which residential, office, and commercial uses are allowed on one site.

The success or failure of these new incentives will affect the future of our cities. The public-private partnership wedded together by incentives is not an easy one, nor is it always comfortable for both parties. Many interests compete for space and amenity in our urban centers, and the choices they present to urban planners and policymakers are often difficult, as current controversy surrounding development of a St. Louis Gateway Mall attests. Competing developers and development plans for this downtown area have occupied the attention of public officials and citizens for months, and the questions remain unsettled. The choices are difficult and the options seem endless.

I will review incentive programs in New York, St. Louis, and Honolulu—three widely separated cities with very different problems—to examine how these incentives work and the planning problems they bring. But I will avoid adding one more voice to the Gateway Mall question.

Some years ago I attended a conference called by the New York City planning department to consider a bonus incentive program for its downtown area. In New York, office development was threatening to wipe out important attractions such as the theater district. In addition, this development often occurred without the amenities planners thought developers should provide. The bonus incentive program was to be an answer. Office developers would be allowed additional floor space and height in return for facilities that served the public interest, such as street-level plazas and new theaters to replace those destroyed in the development process. New York's planners feared the new program might not be constitutional, and assembled a team of national planners and land-use experts to review what they were doing. The book that followed, *The New Zoning*, has

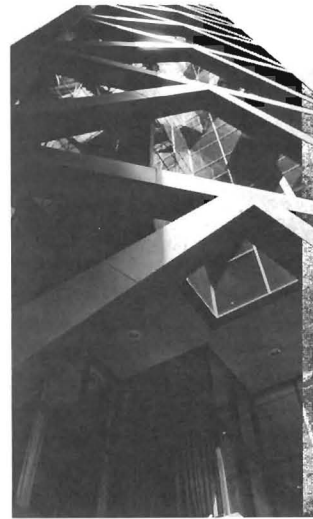
become a leading text on bonus incentive programs.

The idea was quite simple. New York, like many cities, has zoning controls that limit the bulk of office buildings and the floor space they contain. The incentive idea is a trade-off: the additional bulk and office space "compensates" the office developer for the amenities and facilities he must provide. We thought the program workable and legal, although the link between the extra office bulk and the amenities provided was not always clear. Theaters were an example, because theaters are not really related to building incentives. Indeed, incentives often worked because of political and public pressure. In one case, the "deal" for a theater in a new office building was worked out in the mayor's office.

Other cities tried the incentive idea, and San Francisco is a notable example. So is the new commercial development in Rosslyn, located across the bridge from Washington, D.C., in Arlington County. There, planners and developers used incentives to create a new commercial complex complete with skyways.

How has the program worked? There has never been a major legal challenge, and so the legal basis for the idea remains untested. "On the ground," as planners say, the program has brought mixed reviews. In New York, critics complain that the street-level plazas the incentives created are sterile. A walk along Sixth Avenue in midtown Manhattan will let you decide for yourself. A study also found that New York developers actually received more than they expected through extra height and space. The city was shortchanged in the incentive trade-off. In San Francisco, because city planners did not allow for transitions, they created some visual anomalies. The tall Transamerica Building bordering downtown and Chinatown, built in the form of a pyramid, is a reminder that urban design needs careful attention. Some cities have abandoned the program, but others have learned from their experience and have refined their bonus incentives. Though often difficult to administer, incentive programs can be worth the trouble.

The bonus incentive program works, as in New York and San Francisco, when interest in downtown development is strong so that developers are willing to cooperate with the city. Yet some urban downtowns cannot attract new development without public intervention. St. Louis is one example. Until recently, many thought that downtown St. Louis was doomed. Recent years have proved this



untrue. Downtown St. Louis has had an office boom, powered in part by a unique state law that combines property tax relief with private powers of land acquisition under the supervision of the city.

Known as the "Chapter 353" program for the chapter of the state law that enacted it, the program authorizes a series of steps for development entitled to receive a tax abatement. The city begins by declaring an area—which may be a single site or several blocks—as "blighted." The term is an unfortunate word of the art that goes back to the days of slum clearance, but now has a broader meaning. Critics rose up in arms when the Maryland Plaza area adjacent to the Chase-Park Plaza Hotel on the eastern end of Forest Park was declared blighted. Once the site of exclusive shops and still an area surrounded by fine large residential places, Maryland Plaza seemed an inappropriate candidate for "blighting." Under Chapter 353, however, an area can be blighted if it has "economic and social liabilities," and at that time many of the buildings on the plaza were vacant.

A Chapter 353 redevelopment corporation is then formed to carry out a redevelopment in the area. The city must approve the project, after which the corporation can use compulsory powers of land acquisition through eminent domain to acquire land for the project. Redevelopment by the corporation on the project site is entitled to a property tax abatement for a period of years.

Like bonus incentives, the Chapter 353 program allows the city to "give" something for what it "gets." That the program has been successful in revitalizing downtown St. Louis can be seen by anyone who visits the city. Still, as in the bonus incentive program, there are critics. Some argue that the program only attracts development that would have happened anyway. Others claim the city is a net loser in tax revenue. Still others claim the program is inequitable and cite the loss of tax revenue to the city school district as an example. The Chapter 353 program also raises a number of legal problems.

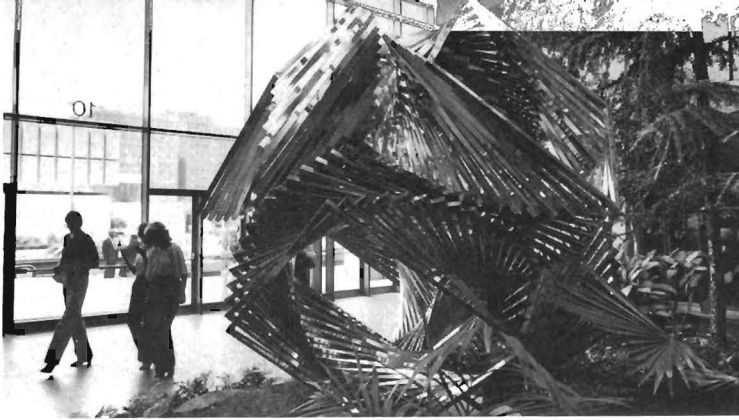
A few years ago, I was asked by the U.S. Department of Housing and Urban Development to review the Chapter 353 program. I put together a team that included two of my former students. Margaret Collins had received the M.S. degree in urban affairs from the University; she is now working in England. Gary Feder had received the J.D. and LL.M. in urban studies degrees; he is now a St. Louis lawyer. Gary reviewed the legal problems in

the Chapter 353 program, while Peggy reviewed its fiscal impact.

Our 1980 book, *Reviving Cities with Tax Abatement*, reported generally favorable results. We could not be certain that the program's incentives were responsible for new office development in downtown St. Louis, but we noted that tax relief was one of the only development incentives municipalities have and that it can be important to developers. We did not find that the St. Louis School District had been substantially hurt by the program, and we found the loss in property tax revenues more than offset by other taxes. The Missouri Supreme Court had approved the major legal features of the program, although we noted that a constitutional amendment in Missouri gave the program explicit support. We also cautioned against exporting the program elsewhere. The St. Louis revenue balance sheet came out well because property taxes are not as important as a revenue source in St. Louis as they are elsewhere. Missouri's constitutional provision also was unique. Without it, a state court might hold a program modeled on Chapter 353 unconstitutional.

We also touched on another controversy in the program. Chapter 353 developers are not required by state law to pay the cost of relocating households they displace and need not contribute to the cost of finding a new dwelling. A decision by the Eighth Circuit Court of Appeals also held that Chapter 353 redevelopers need not meet the relocation benefit requirements contained in the federal Uniform Relocation Act. Congress should remedy this problem. Some "developers" have voluntarily underwritten relocation costs, such as the Washington University "353" Medical Center Redevelopment Corporation, which has required private developers working under its auspices to pay relocation benefits. It would seem seem wise to require this practice, and Congress is considering amendments to the Uniform Relocation Act to bring private redevelopers with powers of eminent domain under the statute.

Anyone who visits Century City in Los Angeles knows what a mixed-use development is. In Century City, shopping, office, and residential towers blend together on a single site. Marina Towers in Chicago is another large mixed-use project, but the concept is new to urban development. Zoning, through which cities manage land use, has always separated different uses and traditionally establishes different areas in the city for residential and commercial



and other nonresidential uses. The mixed-use alternative has a number of advantages. It reduces commuting because people can live near their work. It also provides the "urban enclave" lifestyle admired by planners in which residents can live, work, and shop on the same site or even in the same building.

My introduction to mixed-use development came in Honolulu. Hawaii is a state of four islands, and Honolulu is located on the island of Oahu where most of the population lives. Getting developers interested in building in Honolulu is not the problem. The city is growing rapidly, and wags say that the building crane is the state bird! All of this development has created pressures on land use. Downtown is a cluster of high-rise office buildings next to Chinatown, an area of older low-rise commercial structures preserved as an historic district. Elsewhere, near downtown and along an urban corridor stretching out toward the university and Diamond Head, high-rise condominium and apartment buildings mix with the older commercial areas and the residential bungalows traditional to the island.

Honolulu's planners had addressed the mixed-use problem. They saw that mixed-use development could provide a method of integrating the newer development with the older commercial and residential areas. Honolulu's general plan calls for mixed uses in downtown and business centers to "encourage residential development near employment centers." A more detailed development plan for the primary urban corridor calls for mixed uses in locations in which the mixed-use policy of the general plan can be implemented. In summer 1982, I was called to Honolulu by a consulting firm that was asked by the city government to make proposals to implement the development plan's recommendations. Our report, *Mixed Use*, which was published in November 1982, contains our recommendations.

We faced a number of implementation problems. Like the bonus incentive and Chapter 353 programs, mixed-use development provides rewards to developers. They are allowed to develop more intensively than is provided under the zoning ordinance. These rewards carry costs that others may have to bear. Residents in existing residential areas feared that mixed-use developments would be inconsistent with their lifestyle. Housing is expensive in Honolulu, and some were concerned that mixed-use developments would replace existing

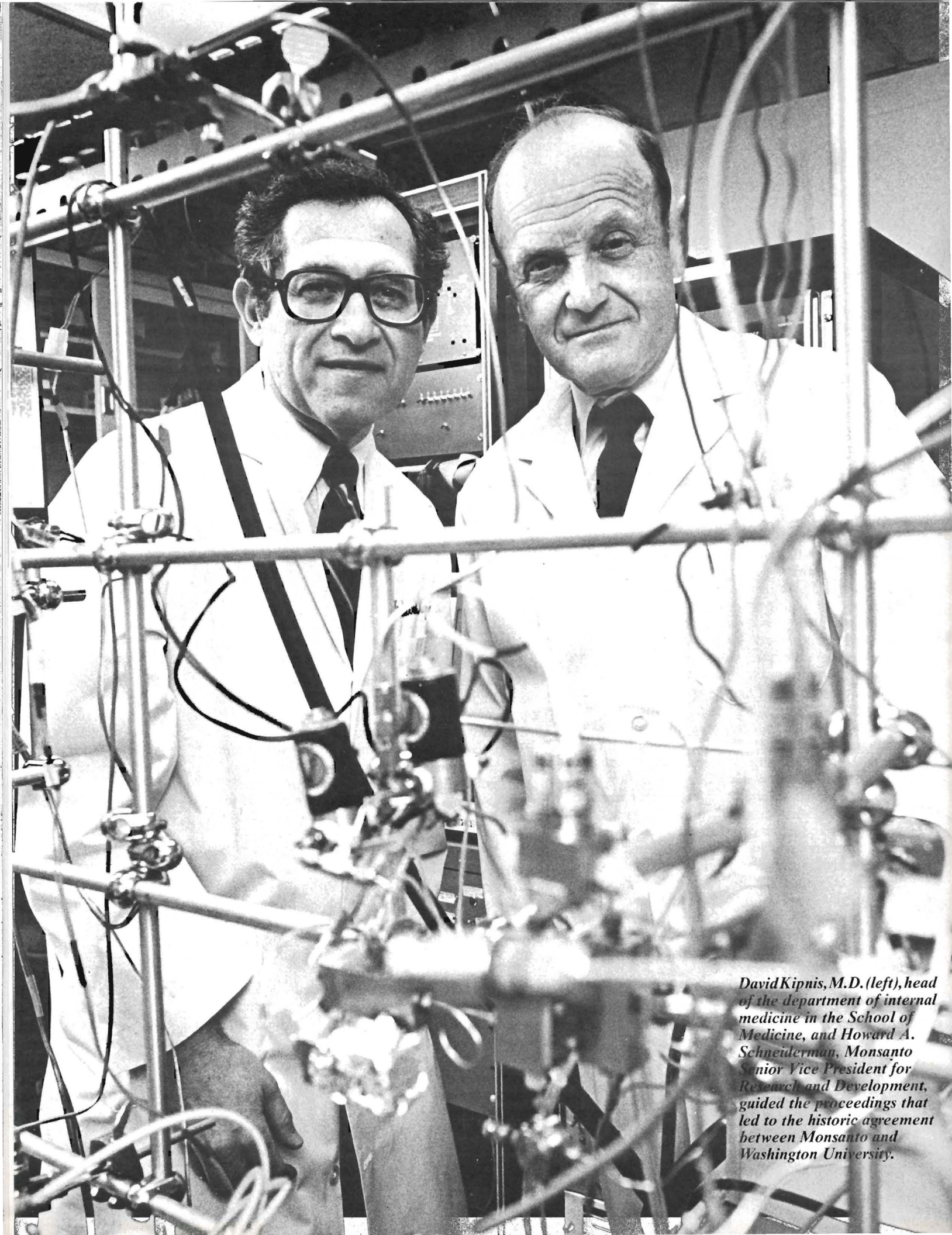
lower-cost housing with more expensive housing. Aesthetics was another problem. High-rise mixed-use projects could obstruct the splendid view of the mountains behind the city, and could be unpleasant if not properly designed.

We had no absolute answers for these problems. We could set down definite and firm rules for mixed-use developments, but these might be arbitrary as applied to a particular site. The same problem arises in bonus incentive programs. We could provide that all mixed-use developments would require review and approval by the city, but this approach would leave quite a lot to official discretion.

Our proposal offered a number of different options to the city, which it is considering. We handled the compatibility and aesthetics problems by breaking mixed-use developments into three categories. We suggested careful design control for simple and low-intensity mixed-use developments. For more complex mixed-use developments we suggested, as one option, that the city draft neighborhood development plans that could take aesthetics and compatibility problems into account. For large mixed-use projects on a single site, we suggested project review techniques modeled on an ordinance adopted by St. Louis County, Missouri.

The housing problem in mixed-use developments remained troublesome. One option, which has been tried in some cities, is to adapt the bonus incentive system to mixed-use development. Mixed-use developers would receive additional bulk and density in other areas in return for the provision of additional housing units.

I began this article by pointing out that many urban centers are revitalizing, that the revitalizing process is carried out through the use of incentives in new public-private partnerships, but that the use of incentives requires hard choices among competing interests. The New York, St. Louis, and Honolulu case studies illustrate these points. What the cases also indicate is that Americans, unwilling to abandon their inner cities, still strive to find solutions to their urban problems. What federal slum clearance and urban renewal failed to complete, private citizens and state and municipal officials have readdressed. With ingenuity, they are finding new approaches. Problems are always with us, but solutions are ongoing.



David Kipnis, M.D. (left), head of the department of internal medicine in the School of Medicine, and Howard A. Schneiderman, Monsanto Senior Vice President for Research and Development, guided the proceedings that led to the historic agreement between Monsanto and Washington University.

Allies in the Laboratory

University and Industry Scientists Create a Model for Research Agreements.

Knowledge. Universities have it; industry seeks it. These are the simple reasons why leaders from America's major research universities and the corporate world have joined efforts to use that intellectual dowry locked away in the academy's best scientific minds.

Just such a situation brought the Monsanto Company and Washington University in St. Louis together on June 3, 1982, in a \$23.5 million, five-year agreement to support a wide variety of biomedical research dealing generally with the functioning of the cell. Work will focus upon proteins and peptides.

Several months earlier, Mallinckrodt, Inc. agreed to support hybridoma technology research totaling \$3.88 million. This research involves the production of specific antibodies from artificially created cells called hybridomas. The antibodies hold promise for greatly improving diagnostic medicine and clinical treatment of many diseases.

These new matches between industry and academia have gradually developed into powerful subjects in educational and scientific circles. Writing in *The Nation* on February 6, 1982, David Noble of Massachusetts Institute of Technology called the scientific resources and technological innovation of university research the "intellectual capital" with which corporations are now competing on the national and international markets.

Since the universities are the source of this essential new commodity, says Noble, "High-technology knowledge has become a key variable in our future, which raises many questions. Who will control it? Whose ends will it serve? Whose needs will it meet?"

These kinds of questions were in the minds of David Kipnis, M.D., head of the department of internal medicine at the Washington University School of Medicine, and Howard A. Schneiderman, Monsanto senior vice president for research and development, several years ago when they first conceived of

the agreement. Both wanted an agreement that would face the unsettling questions raised when industry and academia work together.

They perceived that Washington University, Monsanto, and, indeed, the world were in the midst of a scientific revolution rivaled only by that of the early twentieth century, when Albert Einstein and a handful of natural scientists overturned mankind's perception of how the universe operates. In the view of both scientists, today's startling developments in biology and biomedical sciences—including a battery of new techniques for manipulating genetic material—will have as profound an effect as the revolution that launched atomic power and the space age.

Three years ago, Kipnis and Schneiderman arranged a meeting of twenty senior scientists from the Washington University medical school and a similar number of Monsanto scientists and administrators. After several days, the groups established the working relationships that in the course of two years would "evolve an administrative network and contractual agreement which acknowledges the independent and mutual goals of both organizations," says Kipnis.

Why did these two institutions decide to work together? "We wanted to maintain a leadership position in this revolution," said Kipnis, "not only as a center for research but also as a center for training. That meant that we had to expand the scope of our activities and enrich what we currently have. All that takes new resources."

The result is an agreement which Kipnis hopes may serve as a prototype for other university/industry ventures of this kind.

About two weeks after Monsanto and Washington University signed their agreement, both Kipnis and Schneiderman testified before a congressional committee looking into industry-university alliances.

Describing himself as a "marriage broker" for the Monsanto-Washington University collaboration, Schneiderman said, "I know the good points of both partners, and I have seen the defects.

"I know these hearings reflect a real concern about the value of this kind of association. Many people suspect that a contract between a company and a university threatens the academic freedom to pursue basic research, threatens the academic freedom to publish, and ultimately may undermine the system upon which we count for the discovery of new knowledge and the training of the thought leaders of the future. There is a concern that industry will encourage universities to pursue excessively utilitarian goals and to neglect the tough, long-term fundamental questions.

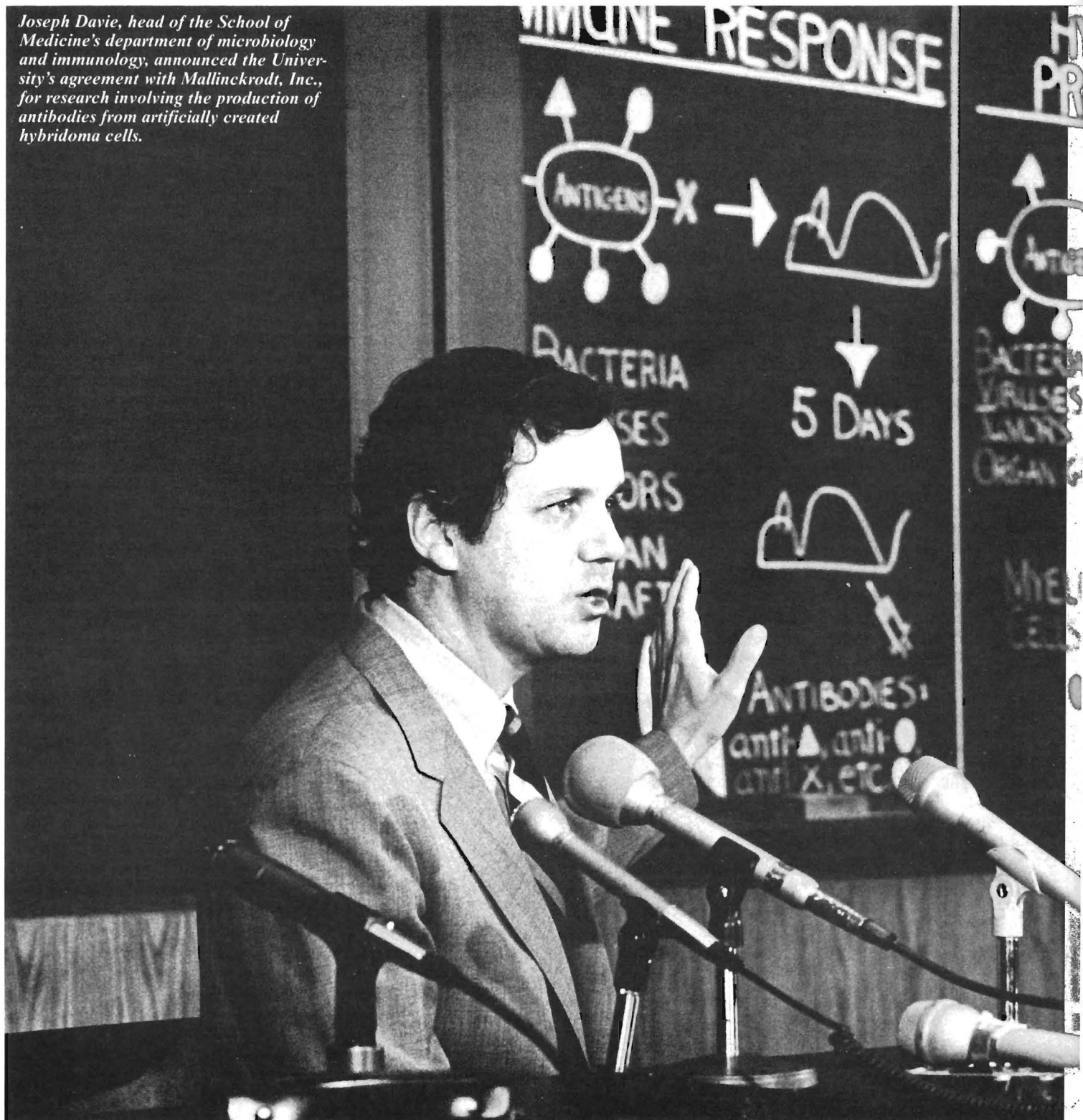
"We addressed those concerns as we wrote this contract—those concerns and many more. I am confident that we not only have safeguarded the academic freedom of Washington University, but in fact, we are enhancing it. We are convinced that our contract not only preserves the goose that lays the golden eggs, but will significantly increase its egg production for the public good."

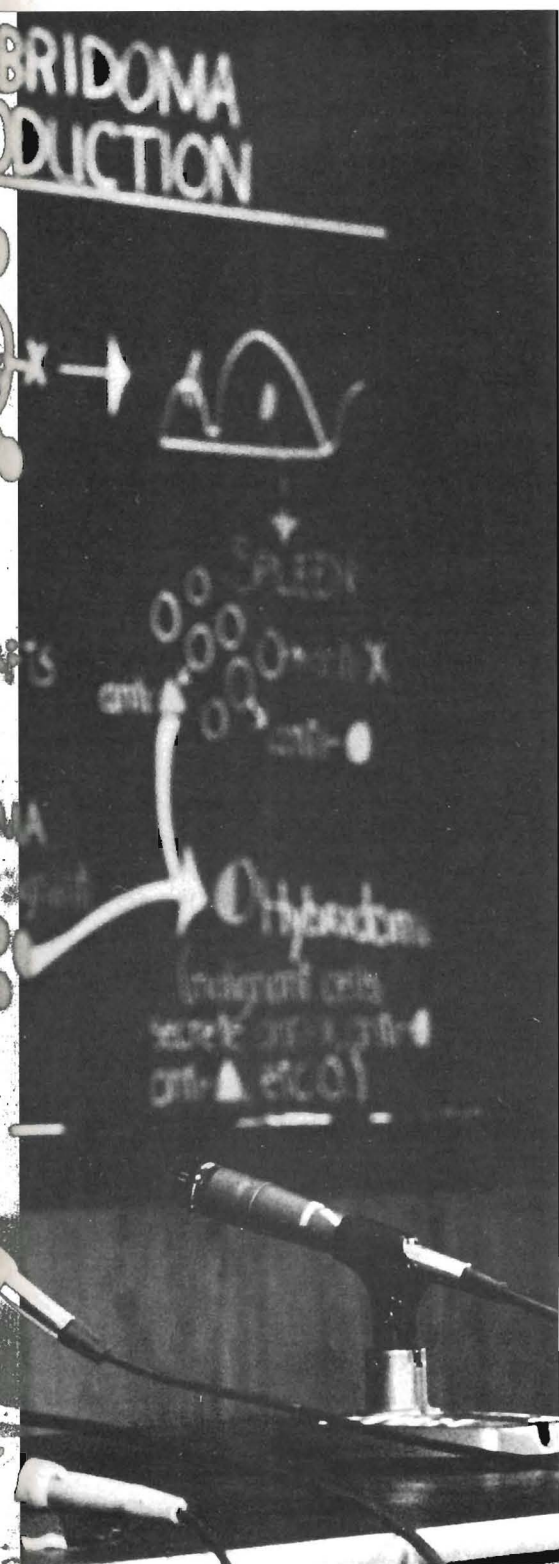
Both parties have very much to gain by the contract.

Monsanto's main reasons are the potential inventions, innovations, and new biomedical techniques—the intellectual capital—that will come from the research they are funding. Mallinckrodt's reasons for its agreement with Washington University are similar, according to its president and chief executive officer, Ray Bentele: "In entering into an agreement with Washington University for long-term research into hybridoma monoclonal antibodies, Mallinckrodt has made a logical extension of its interests in diagnostic medicine and health care."

Monsanto has been in the medical business since 1917. "Our medicine-related activities range from being the world's largest manufacturer of aspirin,"

Joseph Davie, head of the School of Medicine's department of microbiology and immunology, announced the University's agreement with Mallinckrodt, Inc., for research involving the production of antibodies from artificially created hybridoma cells.





says Monsanto's chairman John Hanley, "to the production of L-Dopa for treating Parkinson's disease and to genetic engineering—with many stops in between."

During his congressional testimony, Schneiderman said that the company's goal is "to become a full-fledged member of the health-care field. We view this aim as both socially responsible and commercially attractive."

With this goal in mind, Monsanto undertook in 1974 what was then the largest contract of its kind with a university—a \$23 million agreement with Harvard University for studying human organ development. This step gave Monsanto a "window on biology" that substantially changed the direction the company would take in pursuing health-care products. That direction eventually led westward to Washington University.

Monsanto is by no means a pharmaceutical house, but it has targeted the human health business as a future growth area. Like many companies facing the biomedical revolution, Monsanto is still assessing the extent to which it would like to become involved. This contract gives the company some flexibility for such involvement.

Contract committee member Luis Glaser, Ph.D., head of the Washington University School of Medicine department of biological chemistry, said, "This contract gives Monsanto access in an advisory capacity to a first-rate group of scientists who can provide some guidance, not only in terms of any research project that may be supported at the University, but also in terms of developing an in-house research capability."

Kipnis also believes that this kind of contract gives biomedical researchers who normally deal in basic study the added incentive of seeing their work applied to commercial use for the good of humanity. The existence of a broad base of funding has the additional effect of attracting top-notch researchers to the University. Last year, according

to Kipnis, the federal government sponsored more than \$50 million worth of biomedical research and training at Washington University. The Monsanto agreement brought in \$3 million in fiscal 1982-83. On the other hand, he notes that industry-sponsored research is not expected to exceed 10 percent of the University's federal support, nor should such agreements be expected to replace or supplement funds received from government sources.

Washington University administrators also have noticed the effect patent royalties historically exert on institutions which hold exclusive rights. The classic case is that of the Wisconsin Alumni Research Foundation, which in the 1920s licensed the vitamin-D process of that university's Harry Steenbock. The funds from this windfall still do much to support research at the university. Other good examples are patent licenses on yogurt cultures by the Institut Pasteur in Paris and on Gatorade by the University of Florida.

Stanford University is another case in point. Dozens of computer firms have sprung up in Silicon Valley, a few miles from campus, because of the discoveries made at the university. And Stanford, which shares in some of the basic patents regarding gene-splicing, each year receives more than \$2.5 million from its discoveries.

The pivotal provision in the Washington University-Monsanto contract is the establishment of an eight-person advisory committee equally representing each partner. This committee will administer the entire research program, including reviewing and approving research proposals, distributing appropriate funding, and acting as a liaison between the University and Monsanto.

The chairman of the advisory committee is David M. Kipnis. In addition, the three University committee members are: Luis Glaser; Paul Lacy, Mallinckrodt Professor of Pathology and head of the department of pathology; and Joseph Davie,

professor and head of the department of microbiology and immunology.

For Monsanto, the four advisory committee members are: Louis Fernandez, vice chairman of Monsanto; Howard A. Schneiderman; G. Edward Paget, director, biomed program; and David Tiemeier, Monsanto fellow. Any action to approve or disapprove funding, to set up funding amounts, and to discontinue funding will come about by a decision of this committee.

The funding will support research projects in the broad field of "cellular communications"—basically defined as the study of how cells function individually and with each other. Some possible research that falls within this broad definition includes the study of blood coagulation, the study of drug receptors and inhibitors which determine how drugs work in the body, research into the body's immune system, studies dealing with the nervous system, and a battery of studies related to proteins and hormones that travel between cells.

The advisory committee will allocate at least 30 percent of its funding to exploratory or fundamental research in this wide area. The remaining 70 percent may go toward specialty projects in which Monsanto sees "immediate commercial utility either in terms of technologies or products or both."

The guiding rule for all research is that it intersects the strengths and interests of both Monsanto and the University.

The University faculty members will be at liberty to publish the results of any research they do under the Monsanto funding. Monsanto, however, will exercise the right of prior review of such material if it contains potentially patentable technical developments. If so, Monsanto can request a short delay of submission for publication or other public disclosure in order to begin the patent process. Such review is necessary because many foreign patent laws require the filing of patent applications before public disclosure of inventions. However, it is not expected that delays

Funding will be carried out as follows:

Contract Year	Exploratory Projects	Specialty Budget	Contract Year Budget
82-83	\$1,500,000	\$ 1,500,000	\$ 3,000,000
83-84	\$1,600,000	\$ 2,200,000	\$ 3,800,000
84-85	\$1,700,000	\$ 3,000,000	\$ 4,700,000
85-86	\$1,800,000	\$ 3,800,000	\$ 5,600,000
86-87	\$1,900,000	\$ 4,500,000	\$ 6,400,000
Total	\$8,500,000	\$15,000,000	\$23,500,000

in publication will be an issue, since Monsanto scientists' awareness of most research will provide significant advance time for the patenting process to begin.

Although Monsanto will have the right to an exclusive license of any patents on an invention that comes from the funded research, the University will maintain the patents as its sole and exclusive property and receive royalties from Monsanto licenses. Furthermore, the resulting royalties will go to the University for support of its educational and research programs—not to individual researchers. Monsanto will pay for and carry out the entire patenting process. If Monsanto does not elect to license a patent, the University is free to license such patents to others. Similar conditions exist under the contract with Mallinckrodt.

The contract also contains important provisions for cooperation between Monsanto and the University. Monsanto scientists and technicians will spend time in University laboratories learning new techniques and information. On the other hand, Monsanto will share its knowledge and skills in genetic engineering, nucleic acid chemistry, synthetic organic chemistry, and analytical chemistry with University researchers. Monsanto also will provide use of its facilities—such as superb isolation and tissue culture facilities—and use of biological and other materials.

In the third year of the agreement, and every two years thereafter, Monsanto

and the University will form an independent scientific review panel made up of distinguished scientists not connected with either institution to review the cost effectiveness and scientific merit of the projects being funded.

This is the second program of this nature under way between Monsanto and Washington University. Earlier, the two institutions signed an agreement in which Monsanto will provide \$1.5 million for faculty research in the field of hybridomas, materials which may have valuable diagnostic uses.

Chancellor William H. Danforth said, "We have tried to learn from the recent experience of others to create a prototype for future collaborative efforts between industry and higher education—an agreement which protects fully the integrity of both parties."

Schneiderman concluded, "We expect that new therapies developed through this exciting drug-discovery partnership will rapidly be brought into public use. With the extensive biomedical skills of Washington University plus Monsanto's ability to turn inventions into valuable products, this joint research venture should ultimately benefit society on a scale not possible by each institution working alone."

Joseph Davie, M.D., principal investigator in the hybridoma research agreement with Mallinckrodt, sees the same kind of benefits occurring. "This research could be important for the University, for industry, and, most important, for society," he concluded.

Do Agreements Protect the Interests of Both Parties?

Industry and the Research Universities Feel Safeguards Exist. Government's Verdict is Still Out.

Industry, according to a recent *Business Week* special report, "is turning to universities both as a source of research talent and future employees."

Echoing the trend toward industry/university research agreements, Arnold F. Kanarick, vice president for human resources at Honeywell, Inc., says, "The rate of technological change behooves us to make these connections." Such connections are, some say, a way for industry to tap the creativity of the best scientists working for educational institutions.

Industry's viewpoint on these principles was expressed in a January 1982 article in the *Journal of Medical Education* by Monsanto Chairman John Hanley. "The way the problems are studied should be left to the researchers, who are free to publish their findings eventually, provided their sponsor's interests have been protected and the company can commercialize useful products growing out of the program."

Some academic purists, however, object to such agreements. Rollo Park, chairman of the physiology department at Vanderbilt University, is one. He questions scientists' motives for entering these pacts: "Scientists should remember that industry is not devoted to the advancement of science. Its aim is dollars—and I'm not saying that is bad—but one has to realize that to industry, research must be directed in order to be profitable."

Nevertheless, there are two basic principles that emerge. Scientists must be able to follow whatever path their investigations demand (the difference between basic research and that applied to products); and they must reserve the right to publish their data as soon as possible.

Prominent voices in the news media—ranging from the *New York Times* to *Science* magazine—have invested thousands of words in the subject. Nearly all have done so with a concern for traditional academic principles on



Monsanto Chairman John W. Hanley

research and publication of results.

The complicated issues surrounding industry/university matches have not gone over the heads of congressional leaders, either. If a university project first receives federal funding, which serves to buy equipment and support staff, and later comes under the auspices of an industrial contract, would it be possible that the private company might end up using public funds?

Representative Albert Gore, Jr., chairman of the House Subcommittee on Investigations and Oversight in Science and Technology, has taken a keen interest in such enterprises. In July 1981, he threatened to subpoena the \$50 million contract between Hoechst and Massachusetts General Hospital. Gore says he was concerned that the "technology would be moving from federally funded research areas to the company-funded research and back and forth." Despite claims by hospital officials that taxpayers' money would not be involved in Hoechst-sponsored research, Gore continued to press for

the details of the contract. The details were eventually supplied and apparently Gore was at least partially satisfied with what he saw, although the matter is far from closed.

Gore held additional hearings in June 1982. Much of his subcommittee's concern has been aroused by the fact that industry support of campus research—less than \$100 million a decade ago—climbed to more than \$200 million in 1982 and is expected to reach \$600 million in the 1980s.

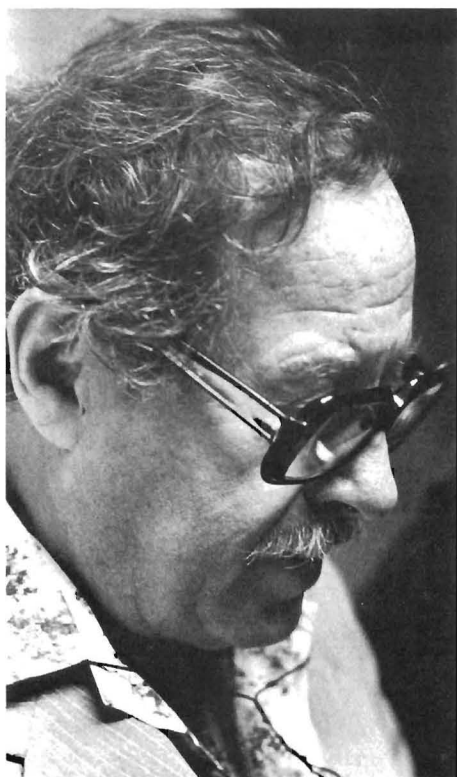
As a result, university administrators have convened two major meetings to deal with regulating some of the problems. The first major university/industry conference was in March 1982. Five university presidents, led by Donald Kennedy of Stanford, invited some thirty academic and corporate leaders to a retreat in the Pajaro Dunes, California. Then, in December 1982, a meeting was attended by more than 400 academic and corporate dignitaries at the University of Pennsylvania in Philadelphia. The conference was sponsored by the nation's leading research universities (including Washington University) and was supported by Smith Kline-Beckman.

Both meetings concluded that the contracts in question are good for everyone concerned. But only if the partners recognize the legitimate needs of each other—namely that academics must maintain at all costs their open communication and freedom of inquiry; and corporations must secure the spinoff patents and profits they seek.

Washington University's Samuel Guze, vice chancellor for medical affairs, seemed to catch the tone of the Philadelphia meeting, convened under the banner "Partners in the Research Enterprise," when he summed up his feelings: "There is nothing wrong with a university carrying out research that may result in commercially successful products, so long as such efforts do not distort the university's academic goals and priorities."

Remembering Tennessee

By John M. Pickering



Tennessee Williams

Thomas Lanier Williams, as he then called himself—Tom, as we called him—contributed 20 poems to *The Eliot*, Washington University's undergraduate magazine, between November 1936 and February 1938. Tom's poems were perfectly crafted, deeply felt (in a late adolescent way), conventionally designed, and yet subtly revealing of the themes he was to develop in his plays.

"We have been looking for poetry like his for some time," commented Arleen Thyson in her editor's column. As managing editor, I found Tom the model contributor: reliable, neat, careful, and literate. He met every deadline with his impeccably typed poems, each ready for the typesetter without correcting spelling or usage and without questioning meter, rhyme, or sense. Best of all, Tom's poems conformed with our self-image as a collegiate version of *The New Yorker*,

purveying a heady brew of what we conceived as pungent comment, irreverent verbal and cartoon humor, sophisticated fiction, and poignant poetry. Thomas Lanier Williams, being four or five years older than most *Eliot* writers, came closer to our Eustace Tilley ideal than the rest of us—but not too close.

Because of the big brotherly image he projected in his poetry, I regretted his shyness. I would have liked to hoist an occasional beer with him in our counterpart of Thurber and Nash's Algonquin Grill—Emile Vescovo's Cafe. But I rarely saw Tom except in passing on the Quad; he usually slipped his poems under *The Eliot* office door. He did attend the staff party in June 1937, when I succeeded Arleen as editor, while A. E. Hotchner took my place as managing editor. A staff photograph, taken after that party, appears in Tom's *Memoirs*, and I was touched that he chose it from the thousands he must have considered.

Memory and loss and thwarted desire are the most frequent themes of Tom's poems—conventional late adolescent subjects to the *n*th degree. Conventional too are his forms: sonnets, ballads, songs, odes—mostly iambic and all rhymed save one experiment in blank verse. Yet so skillfully is Tom's old wine decanted into old bottles that, behind our grins, we *Eliot* colleagues were moved, as in:

The heart has secrets that cannot be known

To his less ancient brother of the bone.

Those are the final lines of a "Metaphysical Sonnet" paraphrasing Pascal on mind/heart dualism. I circulated that sonnet, unsigned, at a conclave of two dozen Penn State comparative literature professors. Their consensus was that it was the work of an obscure minor Romantic.

Most of Tom's *Eliot* poems could have been written, or set, in any university environment from Oxford, England, to Oxford, Mississippi. But in June 1937, on his ninth appearance in

The Eliot, Tom produced "Ole 'Sephus (Monologue to a Coon Dog)" in a Southern dialect. We were startled, though we knew of Tom's affection for his Tennessee grandparents and his pride in his middle namesake, Sidney Lanier. Both the South and New England—and the Far West, for that matter—are omnipresent influences in St. Louis, but tend to get papered over, perhaps by the cosmopolitan *Post-Dispatch*. Finally in February 1938, on his last *Eliot* appearance, Tom offered a three-sonnet sequence titled "The Little Town"—an adumbration of *Summer and Smoke* ("It does not change!" she says, and shakes her head"). The manner is still conventional, but everyone in *The Eliot* office felt the first stirrings of Tom's compassion for the onetime Southern belle facing her lost gentility—and, through her, all humans confronting "a world they never made."

Only one of Tennessee Williams's *Eliot* poems sounds a note of optimism—a tentative note at that—a sea ballad ending:

The many reaches of the sea
Containing maybe shores for me.

I know his former colleagues on *The Eliot* would approve my changing the adverb to *surely*, despite the inelegant alliteration.

John M. Pickering, AB 38, has been editorial director of the *Pennsylvania State University Press* for a decade. Previously he worked with commercial publishers in New York and San Francisco. After college he spent three years as a graduate student in New England, four years as a soldier in the South and overseas.

The Shallow Pool

*As one by the side of a pool
who idles at ease
to dabble his feet in the shallows
discovers the cool
green-wavering surfaces rising
in sudden seas,
so am I caught by surprise and
immersed in these
your delicate ankles arched,
your delicate knees,
your face without passion, your hand
without passion, even
your eyes unshadowed,
unshadowed as level land
unshadowed by trees!*

— Thomas Lanier (Tennessee) Williams
June 1937

Recollection

*It was a steep hill that you went down,
calling back to me,
saying that you would be only a little while.
I waited longer than that.
The little grasses continued to stir in the wind
and the wind grew colder....*

*I looked across the deep valley
and saw the afternoon sun
was yellow as lemon upon the dark pines,
and elsewhere pools of cool shadow
crept down from the hills like stains of dark water
widening slowly as the sunlight dimmed....*

*Someone called I think.
I do not remember clearly.
I only know that a long time afterwards
I rose from the grass
and walked slowly back down the path by which
we had come,
the small, winding path,
and noted, here and there, your footprints,
pointing upwards, narrow and light.*

— Thomas Lanier (Tennessee) Williams
February 1937

Tennessee Williams

John Pickering



Luis Glaser: By Dorothea Wolfram

Window on Biochemistry

The major focus of biochemistry today involves the question of how chemical signals on the cell surface tell other cells what to do and when. The answers discovered over the next decade—as surely some of them will be—will bring not only new understanding of the body's chemistry, but also will chart new paths for prevention and treatment of disease. The work going on in Luis Glaser's department of biological chemistry at the School of Medicine offers a window on these investigations.

Ask Luis Glaser what it means to be looking for “a biologically significant binding event.” He will chuckle and say, “Picture a cell on the corner of Euclid and McKinley avenues. We want to know if that cell, recognizing where it is, simply processes that as geographic information or whether the information calls for a response, such as, ‘Well, if I’m there, that means I should turn the corner and park!’” Simple enough. An explanation of a question of cell recognition that throws a good deal of light on the matter.

But getting from simple analogy to the how and why of research in biological chemistry requires a superb guide. Luis (pronounced Louie) Glaser, Ph.D., is that. His world concerns the very basis of life sciences research: the study of the chemistry of living organisms with the goal of understanding—some 50, 100, 200 years from now—what is supposed to happen chemically within the human body, and, eventually, what goes wrong chemically in diseased states.

What is now known is infinitesimally little, even though within Glaser's working lifetime enormous strides have been taken by unravelling the mystery of human genetics through the replication of the molecule DNA, by progress in enzymology, by understanding some of the biochemical functions of proteins and amino acids. We know so little that the world of biological chemistry is one of laboratories, tissue culture, and tedious, sometimes seemingly endless chemical analyses. It is far removed

from patients and disease, far removed even from the study of the human body, for that organism is much too complex to yield its chemical secrets easily. They must be pried from it with painstaking patience and ingenious analogy.

Biological chemistry often involves following a standard formula with endless improvisations. It comes to its answers by paths so circuitous that they often take years, even decades. Glaser uses the word *elegant* with a biochemist's admiration of a process so simple and straightforward as to be awesome. Biochemistry often is elegant; experimenting in biological chemistry seldom is. The biological chemist wants to know not that a liver sliced in half will suddenly begin to regenerate, growing again to very near its original size, but why and how this is accomplished.

“That's a total black box,” Glaser says, using a term that in biological research is equivalent to the physicist's black hole. “It's a classical biological experiment that has been around for years and, despite a good deal of effort, has yet to be solved. Think about it. This adult liver grew and differentiated to conduct many functions, but for years its cells have mostly just sat there. Suddenly, they know not to keep doing nothing, but to grow—to divide and differentiate. And after that's been going on for a while, they know when to stop. But how?”

Today, much of biochemistry is addressing that basic question: what chemical signals on the cell tell other cells what to do when? The question has

both geographic and temporal dimensions. Glaser explains: “Every organism has a structure. Different cells do different things both in space and time. We want to know how a cell knows where it is in space and time, and then how it processes the signals received on the cell surface to decide what to do next.”

All cells must send and respond to signals. Human skin does not pile up to become elephantine; the kidney does not grow endlessly; blood does not reproduce until it bursts vessel walls. Growth ceases, but it also begins again and stops again. When skin is cut it regenerates and, mostly, when the gap is bridged it stops growing. If one kidney is removed or damaged, the other grows and differentiates to expand its capacity. “We want to know at the biochemical level why and when all of these phenomena occur.”

Experimentation in intercellular communication and recognition began some 70 years ago with cell-binding experiments in sponges, but only within the past 15 years has such work received massive attention. In this time, investigation has not been confined to biological chemistry. Scientists in immunology, pharmacology, and developmental biology came independently, and almost simultaneously, to the view that molecules on the cell surface or within a cellular matrix were responsible for specific recognition signals. They also realized that the question of cell recognition had close analogies to the



questions of the specific effects of hormones on cell function; so work going on in a dozen different disciplines began to feed into a whole.

Yet despite major advances since the early 1970s that have led to new levels of understanding, research is still stuck at ground level. The question remains: which surface molecules recognize other cell surface components to generate a biologically significant cell-binding event?

"That's what we are looking at," says Glaser, "but then so is half of the rest of the world." He uses *we* to speak of the work in the laboratory he administers as head of the department of biological chemistry in the Division of Biology and Biomedical Sciences at the Washington University School of Medicine.

"Our work has changed immensely since I came nearly 30 years ago. For decades almost all of biochemistry was interested in enzymology. We were asking how the cell makes certain polymers. We identified the chemical reactions and the enzymes that carry these out, and then we built chemical pathways to show how things went from one stage to another.

"And that took us quite a while. We really didn't phase that out totally until about 1979. By then it was clear that although we had some startling surprises in the '70s about details of these processes, we knew in broad outline what was going to happen. There are some holes, but they were becoming less and less interesting to us, so we are not doing that anymore."

Glaser is reluctant to compare the contributions of his laboratory with those of others, but offers, "Let's say that I don't think you can discuss the synthesis of the bacterial cell wall without discussing the work we did."

Five years ago, as Glaser and his colleagues turned to cell binding, they chose to be extremely selective in their approach. "When you measure in a tissue culture whether two cells bind together, in a sense you are studying a pseudophenomenon. It may not be a natural biological phenomenon, so you must be careful not to become involved in a laboratory curiosity that is biologically meaningless." Isolated binding phenomena may advance understand-

As an undergraduate, Luis Glaser, Ph.D., abandoned plans to enter medical school in favor of study of laboratory medicine. As head of the department of biological chemistry at the Washington University School of Medicine, Glaser maintains that biochemistry remains "great fun."

ing of the processes, but are not where the biochemist wants to be, emphasized Glaser. Instead, his laboratory elected to look at binding events that elicit a response: events in which cell adhesion turns cell growth on or off or triggers differentiation. "We felt more comfortable looking for the molecules that were responsible for such events rather than simply for molecules involved in cell-to-cell binding."

The first step was to identify specific binding events responsible for a response. Easier said than done. The task has involved researchers here and many places elsewhere for almost a decade. In 1981, for a text titled *Cellular Recognition*, Glaser wrote: "Much of the work reported in the literature represents attempts to design assays which allow one to determine whether



Glaser and Paul Rothenberg, an M.D./Ph.D. student, check fluorometer data for a study of the effects of growth-promoting hormones in cells.

a cell can make a choice between two different targets and will adhere preferentially to one or another of those targets." The exact molecular event responsible for this "is in most instances really not understood. It is not surprising, therefore, that a great deal of the early work on cell recognition and much of the work at present is directed toward problems of methodology: the design of assay systems and the interpretation of what is seen in these assays."

Although work in biological chemistry at Washington University is varied, "because we have many very bright people in the lab," says its head, two long-standing collaborative studies exemplify its thrust.

The first is a study of Schwann cells and axons begun and still carried on in collaboration with Richard Bunge, Ph.D., the Beaumont-May Institute of Neurology Scholar in Anatomy and professor of anatomy. "A number of years ago," explains Glaser, "two events started us on this venture.

One was that we had an M.D./Ph.D. student, Jim Salzer, who wanted to combine molecular biology and neurobiology. And this confused us. The second was that Dick Bunge and I happened to sit next to each other on an airplane. Dick told me that he and Pat Wood, a research associate in anatomy and neurobiology, had developed a unique system for the culture of cells in the peripheral nervous system. What they had succeeded in doing was a major advance. They had generated a culture system that contained two cell types and only two cell types, and they could manipulate and maintain them."

The cells in the Bunge-Wood culture were neurons and their cohorts, Schwann cells. Development of an organism's neurological system involves axons, long runners sent out from the nerve to connect to other tissue. Schwann cells are the cells that eventually grow along the axon to insulate it. The analogy, says Glaser, is a long phone wire going from here to there to carry messages and the insulation around it. What excited Glaser and Bunge enormously was the possibility of using this culture to study the regulation of Schwann cell growth. That became

Salzer's project, working with Glaser and Bunge.

In the Bunge-Wood culture, Salzer had the biochemist's dream—a ready-made, purified culture which eliminated the need for design of an assay and provided an adequate supply of material for experimentation.

Because biochemists are interested in cell growth, cessation of growth, and differentiation, their study often involves the embryo, where these are processes critical for development. (They happen much less frequently in the mature organism.) And the isolation of one system of the embryo produces only minute amounts of tissue for study.

For modern biochemistry, which is dealing with progressively small subsets of cells, the want of sufficient tissue to do standard biochemistry is a constant bugaboo. "It's been suggested that we need a new system of doing biochemistry," says Glaser, "but we haven't come up with one. We have come up with some new tools—monoclonal antibodies and genetic engineering—and if you can translate your problem into one which can be answered by using these, it's a breakthrough. But they are not a panacea, just new tools."

Studying the neuron-Schwann cell culture, Wood first published in a short note in *Nature* magazine the observation of the mitogenic signal for Schwann cell proliferation. Salzer, Bunge, and Glaser then established the definitive biochemistry to prove that contact with an axon triggers Schwann cell growth, publishing their findings in a series of three journal articles of joint authorship. "What happens," Glaser explains, "is when the Schwann cell touches the axon, the axon sends the message, 'You are now in a good place, where you should be, stay here and multiply.'"

"Biologically," he adds in excitement, "this is a marvelous system because in the embryo a nerve is sending out an axon and it needs insulation, it needs Schwann cells. But you don't want Schwann cells wandering about everywhere. So this mechanism constrains their growth and development along this wire. Physiologically it's a very clear system and very fascinating." Elegant, he might even say.

Now, extending this work beyond the event of recognition, Glaser and his colleagues can begin to look for the specific molecules that govern recognition.

There was, however, one catch along the way which illustrates why biochemistry frequently deviates from its primary path. Schwann cells grow abundantly and easily in tissue culture; axons do not. No amount of coaxing and pampering will induce reproduction in culture. "So here you take a biochemical sidestep that's proved very useful in many studies," explains Glaser. "You look for, and often find, a tumor cell that expresses on its surface the same molecules you find on the axon. The tumor cell, of course, reproduces well and rapidly, and, if you find what you need, you use that as a mock axon. In our case it's a malignant rat cell known as PC 12. Nancy Ratner has recently demonstrated that PC 12 has the same molecules on its surface as a normal axon. So we're off and running again on that investigation."

Although, at present, it is unclear if binding is protein to protein or protein to carbohydrate, Glaser says, "If I had to, I'd bet on protein to protein." To purify such a protein, however, the biochemist must face the fact that cells contain as many as 2,000 distinct proteins that can be isolated and identified by standard biochemical methods. To purify any one of these is slow, but feasible by present methodology.

"A second major collaborative effort in which we have been involved in the past," says Glaser, "is a long-standing interaction with David Gottlieb, Ph.D., associate professor in biological chemistry and in anatomy and neurobiology. David arrived a number of years ago in the laboratory to try to become more familiar with biochemistry. He taught me what little I know about the nervous system. He also carried out a classical experiment using adhesion assays that he had developed. It demonstrated that cells in embryonal systems, in particular in the chick neural retina, had clear positional information on the surface, so that cells from different regions of the retina were clearly distinguishable by that kind of assay."

"That was extremely interesting in 1977 because the approach was novel and the findings that David made seemed to fit in with broader concepts of how the nervous system might be constructed."

"We're still interested in these kinds of questions. As an outgrowth of this we are currently trying to develop tags to identify the many cell types that occur in the neural retina so that they can be separated and then used for biological investigations. For this we are using the new techniques of monoclonal antibodies, where again we benefited from David's advice and guidance. Sherry Dyer and Gregory Cole in the laboratory have worked out new methods for isolating monoclonal antibodies that can identify individual cells. Many of the antibodies they produce

are useless, but a few are exactly what they are looking for.

"Let's say," explains Glaser, jumping up to use the blackboard in his office, "that cell type A has a molecule on its surface that we represent as a triangle and B has a different molecule we represent as a circle. By looking through enough antibodies, we find one that recognizes and attaches itself to triangles and only triangles, and another that recognizes only circles and so on. When we find, say, the A-type specific antibody, we label it with a fluorescent tag or another molecule recognizable by microscopy. When we add the A-type specific antibody to a disassociated mass of chick embryo cells, it searches through and finds A cells and binds to them. Then when we look at that cell collection under the right illumination, only the A cells light up, and we can collect them by some biochemical method and throw out the rest."

Once the cell types have been flagged with labeled antibodies and sorted out, researchers will begin to manipulate them to see how the development of a cell is affected by its neighbor. They will ask if an A cell needs some sort of signal from its neighbor to begin to differentiate or whether it must touch a B cell to do that and so forth. In this case, they are searching for the cell-recognition event that triggers differentiation.

Summarizing the difficulty scientists have encountered in studying cell recognition since A.A. Moscona's pioneering chick retina studies at the University of Chicago in the early 1960s, Glaser recently wrote: "The failure of the effort of so many laboratories to isolate such molecules is in part a reflection on the complexity of the system. The cells under investigation are complex mixtures of cell types whose adhesive properties may differ. Indeed, the same cells present in different regions of a structure, such as the retina, may show quantitative adhesive differences reflecting their geographical position."



Glaser's laboratory: from left, Rothenberg, Marian Riley, a technician; Kendra Caldwell, a graduate student; Ying-Xin Zhaung, a research associate; Arleen Loewy, a technician; Glaser; Gregory Cole, a research associate; Sherry Dyer, a graduate student; and Dan Cassell, a research associate.

Another difficulty is the relatively small quantities of material that can be obtained from embryos. Finally, the difficulty in fractionating these systems may reflect the fact that adhesion between cells is a consequence of a multistep process, i.e., a series of successive events as well as a reversal of adhesive events. The ability to reproduce these successive events once the cells are disrupted and the cell surface molecules are fractionated may be very difficult."

His final statement seems a masterpiece of understatement. Perhaps basic biological research relies on understatement of its difficulties to keep its spirits up. In doing science, says Glaser with a chuckle and a sigh, "All these things have stops and

starts. Science has these characteristics. You have to go slowly and carefully, of course, but being stubborn is sometimes a mistake. There is often a point when you have to say something is not manageable at this point in time. Being able to do that is an art, but I'm not sure I know how to practice that art very well yet."

Doing science is Luis Glaser's longstanding fascination, although as a child he was quite unaware of the kind of scientific doing to which he would devote his life. Born in 1932 in Vienna, Austria, where his father was a physician, Luis would have predicted for himself, had anyone asked, the life of an Austrian physician. But following the Anschluss in 1938, he and his parents left Nazi-controlled Austria for

Belgium. "There is a phenomenon associated with this that I will never understand," he says laughing. "We stayed there a year while my father earned enough to emigrate, and I went to school there, but to this day I can neither speak nor understand a word of Flemish, though I spoke it fluently at the time."

The visas which the senior Glaser obtained were Mexican tourist visas issued by the honorary consul in Zagreb, Yugoslavia, but they secured the family's entry into Mexico on a permanent basis, and the Glasers established in Mexico City. There Dr. Glaser took up his practice of medicine, albeit this time in Spanish. Luis attended a Jewish elementary school and a Benedictine high school



run by American monks. He picked up enough English to enter college at the University of Toronto—a city in which he had relatives—and to graduate with honors.

I had always intended to be a physician, but circumstances threw me into a different program. As a foreigner entering the university in 1949, I couldn't compete with the veterans for the six-year medical program, so I thought I'd sneak in the back door by taking a four-year science program first. And in about my third year, I decided that I was much too interested in laboratory medicine to deviate from it into medical school."

He came to Washington University as a Ph.D. candidate in 1953 and has never left. "I came out of a very regulated program and had I known what I was getting into here, I probably would

not have come. But I didn't know, and that turned out to be blissful ignorance. There was here then, under Carl and Gerty Cori, no graduate program. Literally, there was no outlined program, and I took very few courses. There were eight or nine faculty members and we all worked side by side in the laboratory. We met everyday for lunch and we learned by talking.

"Actually, I really haven't gone anywhere at all. This place," he says sweeping a book-lined corner office of one of the medical school buildings, "was my lab, right here where this room is now. It was a wonderful experience. We can't do it now with some 220 students running around, but we needed nothing else then.

"And I've stayed because of the unique qualities of this institution. This place is sort of a miracle. I've often tried to decide what happened here that changed this school from a place that was *trying*, to a place that was *succeeding*. Some of it had to be its ability to attract very good people. But there are two outstanding qualities of this school: the high quality of its people and the unique atmosphere which fosters collaborative research. You can't legislate that, but I think we encourage it by the way we recruit our faculty. We grow our own. Many schools don't; they recruit senior faculty heavily from outside, and that gives young faculty little promise or security. Here there is a presumption that if you are good and do good work, you will be promoted and get tenure. That means that our young faculty members are not competing against each other but against an absolute standard."

"Luis Glaser," said a colleague in pathology, "is one of the people who set that standard. In part, his vision fuels the direction of this institution. I have seen him in many situations from dealing with students to heads of departments, and he is always the person who recognizes and does what is appropriate. He is a marvelous

individual who combines incredible knowledge of science and organizational ability with a genuine understanding of human nature. He's a rare and wonderful human being."

The fun of science," says Glaser in explaining his delight with his work and his specific place at Washington University, "is teaching it and doing it with bright people. My only regret is sometimes I think I should be out there doing it, instead of sitting behind a desk administering it. When I first became department head, I tried to work in the lab, at least on Saturday, but now Saturday is a time to catch up on paperwork without the distraction of phone calls and appointments. I wonder if I'll ever be able to go back. But that's a long way off, so I'll just have to wonder for a long time yet.

"But exciting work goes on in spite of my absence from the laboratory, proving perhaps that I'm not needed there. Within the last year new insights into regulation of muscle cell differentiation have come from the work of Eric Olson, Kendra Caldwell, and Bryan Lathrop in the laboratory, and Paul Rothenberg and Dan Cassel have succeeded for the first time in documenting some of the earliest effects of mitogenic (growth-promoting) hormones in cells and tissue culture. Participating in some way in that kind of activity makes being a biochemist fun."

"One thing anyone who works with Luis discovers quickly," says Richard Bunge, "is his fantastic ability to keep up with modern biochemistry despite his administrative load. Collaboration with him is such a joy not only because his knowledge is so broad, but also because he is so easy to communicate with. He always returns your calls; he always responds to your concern with undivided attention and intelligence. It's perhaps not correct to call him Saint Luis—which we do fondly sometimes—but he does accomplish much, seemingly miraculously."

Comment

On the inside back cover of the winter magazine, we said, "Washington University has not been listed in the top-20 poll of sportswriters in any intercollegiate athletic activity for as long as anyone can remember." Not so. Demetri Kolokotronis, AB '53, of Saugerties, New York, remembers when Washington University's basketball squad made the top national rankings for a brief moment of glory in 1950-51.

Those were good years for basketball under coach Blair Gullion, sometimes even great years. If we sacrificed just the tail end of *Bob and Ray* to race from the parking lot down the stairs next to Wilson Pool, we'd be in the bleachers just in time for a game against Idaho, or Beloit, or Loyola, Michigan, SIU, Indiana or Wayne State, Iowa, Arkansas, Purdue, Drake, Illinois, or even Missouri.

From the Bears' December 7, 1950, 45-42 home victory over Missouri U.'s Tigers hangs the Kolokotronis tale. The defeat of the Tigers was, in itself, an upset, because the Tigers were frequently nationally ranked. It came, according to the records, on the strength of Charley Cain's 14 points and Gus Miller's nine points with these top scorers and good defense backed by Dave and Dick Pearce and Pete Mollman.

But a week later when the Tigers knocked off defending national champion City College of New York and then defending Big Ten champion Ohio State, both on the road, the Bears' victory looked big enough to put the team into the polls. The records, however, don't tell a part of the tale that Kolokotronis recalls.

"It didn't last long," he writes. "It was later found that CCNY had thrown the game to Missouri, and Washington University's win over Missouri was revalued accordingly. What especially tickled Bear fans over that national ranking, however, was that when the Bears were ranked, they stood ahead of

St. Louis University, whose subsidized athletes were a basketball power at the time."

The records do, however, prove that no matter what happened to Missouri's Tigers, the Bears' triumph was no fluke. The 1950-51 basketball Bears again gained attention on the national intercollegiate scene with a 52-49 win over then 18th-ranked Beloit College. And the same squad split two games with James Millikin University in Bloomington, Illinois, which despite its small size was a basketball power to be reckoned with that year. Both Beloit and Millikin played postseason tournaments: Beloit losing in the first round of the National Invitational at New York, but Millikin advancing to the finals of the National Association of Intercollegiate Basketball meet at Kansas City.

The 1950-51 Bears finished the season 16-5, and Cain was a Little All-American choice. Other team members were Duncan Hansen, Rich Rockefeller, Norm Frolow, Vern Koester, and Hadley Hasemeier. Gullion's 1949-50 team had also been a standout with a 55-53 road win over Vanderbilt and a final record of 17-6.

As long as we're in the basketball recollection business (thanks to Bruce Mellin, long-time Bear athletic trainer, who provided the particulars), sports records here seem to agree that the 1955-56 team was Coach Gullion's best ever. Its 17-5 record narrowly missed an NIT invitation. "Jim Barton and Bud Cristal, who rank one-two in career scoring at the Hilltop, were the stars of a team which lost four of its five games by a combined total of ten points," says a later *Basketball Guide*. "Highlighting the season was a narrow 75-74 loss to Illinois before a national television audience and wins over Cornell, Loyola, Canisius, and Utah State."

Basketball, of course, is back on the Hilltop after many years of absence, and although the first

two years' team records have been nothing to crow about, Fred Amos, a six-foot-six sophomore from Chicago, finished this season with a 21.2 average, scoring 551 points in 26 games. With his 341 points as a freshman, Amos is within easy shooting distance of Jim Barton's 1953-57 career-high-scoring record of 1,215.

In addition, Washington University's Lady Bears are beginning to set up new records for women's basketball. Laura Vrlenich, a sophomore from St. Louis, scored 274 points last season for a 16.1 average.

Obviously, scholar-athletes can be outstanding performers and deemphasized intercollegiate sports can bring excitement enough to be remembered for decades. There are, after all, certain other advantages to not being a big-time sports power. A medical school physicist tells of joining the faculty of one of the South's glory football schools and feeling pretty good about where he was as a professor with tenure. Yet as he came from the lab one Saturday afternoon, he discovered that the car he'd parked in his assigned faculty space had been towed away. When he protested the outrage, he was chided for not recognizing that on a home-football Saturday, all parking spots belonged to the alumni.

I'm Getting an Athletic Complex at Washington University

Black tee-shirts emblazoned in red and green (by George the Tee-Shirt Man of recent Ronald Reagan fame) boasted, "I'm Getting an Athletic Complex at Washington University." They were a part of the April 15 ground-breaking ceremonies for Washington University's new \$13 million sports and recreation complex. The architects' plan calls for new construction to be integrated with renovation of existing structures.

A multipurpose gym, a new swimming pool, racquetball and squash courts, and supporting facilities such as locker rooms and offices will be wrapped around the present field house and Francis Gymnasium. Both structures will be completely refurbished. No major renovation

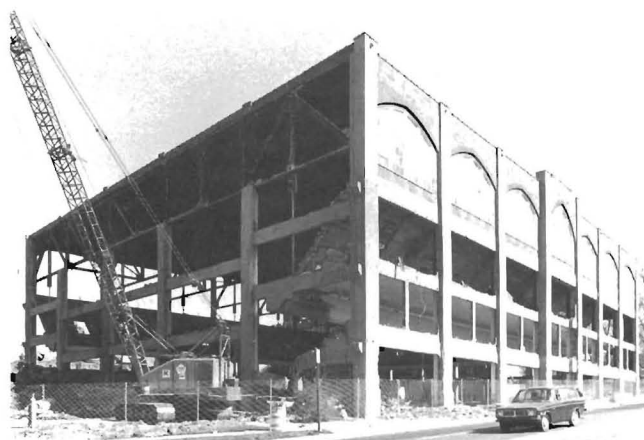
or expansion of the University's athletic facilities has been undertaken in 50 years, though the University's successful varsity and intramural programs have completely outgrown those facilities.

The new main entrance will be through the link between new and existing structures on the artist's conception seen just north of Francis gym. A new gym with an enlarged aquatics area will replace Wilson Pool; ten courts for handball and racquet sports will be linked to the rehabilitated field house and restored gym by skylighted concourses.

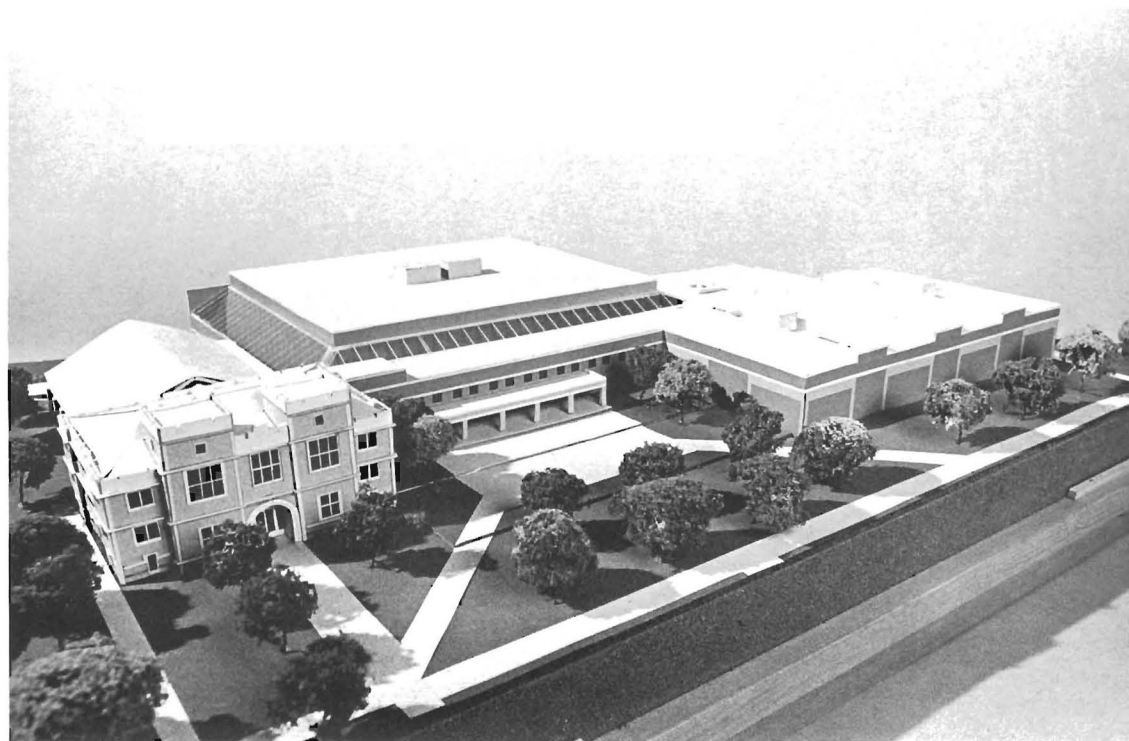
Total seating capacity of the field house for sports events will be about 3,400 with 2,000 fixed seats and

seating for 1,400 on movable bleachers. For some events 800 seats on the floor will bring total capacity to 4,200. Completion is scheduled for spring 1984.

Architects are the Pearce Corporation of St. Louis and the Eggers Group of New York City.

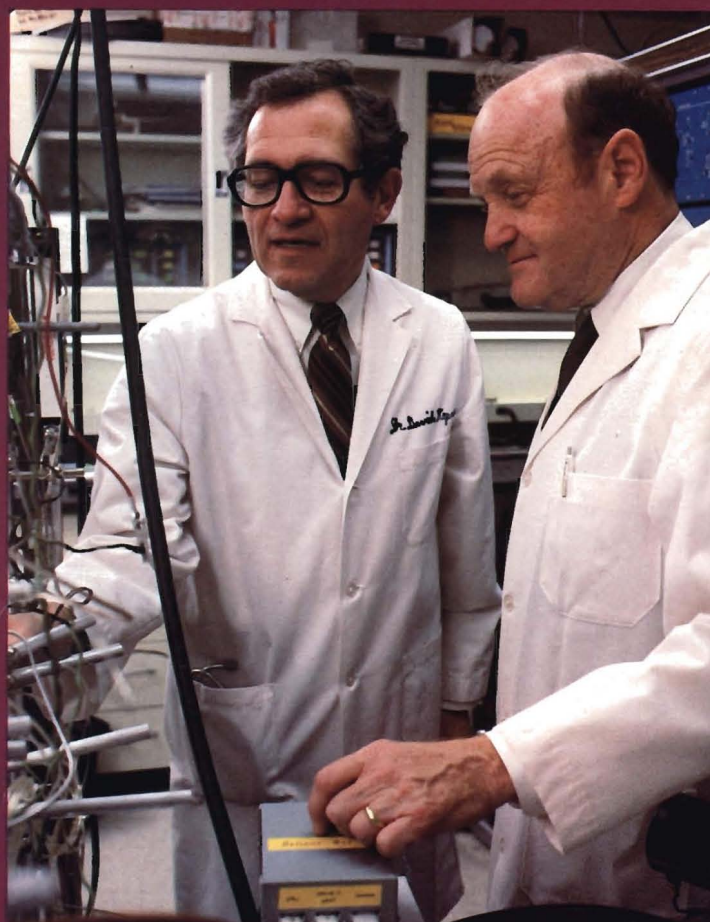


As work on the new facilities began, daylight could be seen through the Field House/Wilson Pool structure. Passersby on Big Bend Boulevard quickly recognized the extent of the renovation to be accomplished.



Architects' model shows how the new athletic complex will wrap around and extend existing facilities. Francis Gym is at left with the Field House northwest of it. Main entrance will be from the courtyard in the center of the new complex.

043



Allies in the Laboratory, see page 18.